

# FLIGHT

&  
The AIRCRAFT  
ENGINEER.

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

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## EDITORIAL COMMENT.



IN the course of his admirable speech before the Associated Chambers of Commerce last week, General Smuts said nothing that appealed so much to the public at large as when he announced that the war is to be taken by air to Germany itself. Mixed with the natural satisfaction felt at the clear statement of future policy there must be, however, a feeling that General Smuts carefully avoided being too specific. In fact, he went to the other extreme of caution in declining to enlighten his audience upon the immediate intentions of the War Cabinet in this most important matter of an aerial offensive against Germany, and left it to their own imagination to probe his meaning. The great question that agitates the minds of the public is whether, first, the Cabinet does in fact intend to carry the aerial war to Germany, and, second, when? General Smuts, in a somewhat non-committal manner, answered the first part of the

### War in the Air on Germany.

question when he predicted that the German air war on defenceless civilians will not only fail, but would prove a terrible boomerang to the enemy, and that we were now most reluctantly forced to apply to him the bombing policy which he has applied to us. The Government, he said, has no longer any choice in the matter, but he did not say whether, having had the choice forced upon it, the Government intends to take immediate and ruthless steps to translate into deeds the policy formulated on their behalf by the gallant General.

It is perfectly true, as he said, that a very bitter temper is growing up in this country, which the Government will have to reckon seriously with in settling their air policy. We should like to take it a little farther and say that the temper to which General Smuts alluded has grown to the point when it will not be appeased by empty platitudes or nebulous promises of action is some dim and distant future. Ever since the outbreak of the war our air policy has been one of waiting on events—a real policy of opportunism—and the country is becoming tired of it. The very nerve centre of the Empire is being constantly attacked—and successfully attacked—by the aircraft of a Power to which we are assured we are superior in the air, and we meet those attacks with passive defence. This is not in accord with the fighting traditions of the race, and it is little wonder the people have grown restive under the repeated insult of having the capital of the Empire bombarded with practical impunity. It is not the damage done, which is small enough in all conscience, or even the casualties inevitable to raids on the smallest scale—it is the feeling that the hitherto inviolate shores of England are open to invasion by the enemy, who can come and go almost as he likes, that causes the public gorge to rise. Ever since the Germans began their unholy campaign of raiding our shores the demand has been insistent for reprisals, and that demand has been met with nothing but platitudes and half promises that unless the enemy desisted from killing and maiming our civil population we should—do something. Up to now we have done nothing in countering the German air offensive, to bring home to the German at home a taste of his own beastliness, and except that the new promise is more definite, more categorical, than usual, it does not seem to us that General Smuts has brought us any nearer the point at which the British people can feel that at long last the Government really

regards a counter-offensive in the air as the best and only remedy for the continuous raids on British open towns. We agree entirely with General Smuts in regarding these developments of the art of war as truly bad and immoral, and, like him, we should infinitely have preferred that both sides should desist from such cruel practices. We did not initiate them, and the world is our witness that we have been infinitely patient under their infliction, but at last the patience of the people is exhausted and they are looking to the Government to lose no time in putting its promise into execution. Not only must the aerial war be taken into Germany, but it must be taken there at once—not next Spring, or even next month, but immediately—subject always to military requirements.

#### The Moral Effect in Germany.

Lest there should be some who doubt that an aerial policy of carrying the war home to German towns would produce the right effect, it should be emphasised by the Press of this country that already the mere threat to carry out reprisals has been productive of salutary effect in the towns of the Rhineland provinces, which are most open to attack by Allied aircraft. Cologne, Dusseldorf, Essen, Wilhelmshaven, and half-a-dozen other Western German towns have already lowered their lights, and the municipal authorities have called panic-stricken meetings to discuss measures for meeting attack from the air. From all accounts, the weather has become distinctly "windy," as our soldiers would describe it—and that before these precious apostles of "kultur" have been hit at all. To our way of thinking, the matter hardly admits of doubt—the oftener and harder we hit them, the sooner they will squeal and the sooner the German Government may think it wise to call off its raiders.

One German paper advances a peculiar theory in connection with the raids on England. We do not think there is much in it, but it is interesting if only for the light it throws on Hun mentality. Briefly, the theory of this journal—the *Munich Post*—is that England is being raided, not in the hope of scaring the British people into demanding a premature peace, but for the deliberate purpose of compelling us to embark upon a policy of counter-raids, which would have the effect of stiffening the declining feeling among the Germans in favour of prosecuting the war to a victorious (German) end. Whether there is anything in it or not does not matter. As the theory is set forth it means one of two things. Either it is a clumsy attempt to hold back the Allies from their avowed purpose of bombing German cities—in order to avoid stiffening the German war feeling—or it discloses an extremely cynical outlook on the manners of the official Hun. If it is the former, then all we can say is that, having begun the game of dropping high explosives on residential towns and pursued it until our patience has gone, it is too late for the Hun to protest that by hitting him back we shall only be prolonging the war. The war is going on until Germany and her allies have been soundly beaten, whether that happens in a month, a year, or in ten years, so the effect believed in or hoped for by the journal in question does not matter the smallest. If the second alternative is the governing one, then it looks as though German eyes were being opened to the sanguinary cynicism with which Prussian militarism regards the civil population of the Empire.

The latter are to be offered up as sacrifices to the god of war, so that he may renew his strength. Some of them are, as a famous German general once remarked of raw troops, to be "a little shot at" *pour encourager les autres!* Surely comment would be superfluous.

#### British Airmen and Aircraft.

Mr. Holt Thomas is becoming quite an enlightening correspondent of the Press. He has now taken up the cause of the British airman and aircraft, whose wonderful performances in the war have, it is true, been somewhat lost to sight by a section of the newspapers when a foreigner has done something more outstanding than usual. The text on this occasion is Captain Laureati's flight from Turin to Hounslow—a wonderful feat, it is true, but one that was made a little too much of by the papers, for as Mr. Holt Thomas points out, it has been more than matched by British machines, flown by our own countrymen, as witness the London-Constantinople flight, which considerably ante-dated it. It is not that we want to plume ourselves on leading the world in everything, but the trouble in connection with the booming of the performances of other people while ignoring our own is that it creates an impression among the nations that we are hopelessly behind the times. Even our Allies are apt to get the impression that we are not pulling our full weight in the war. True, the official side of the Allied nations knows that we are indeed pulling our weight and a little more, but unfortunately the parsimony with which news is doled out leaves the people in the dark—and it is the people who matter. From the beginning of the war our publicity machine has been greatly at fault. There has been a little improvement lately, but only a little, and in spite of all the efforts this country has put forth, neutrals and Allies alike are left to gather the impression that we are still falling short of our duty to the Alliance. One of these days we shall get ahead of the Press Bureau with a real sense of the proportion of news and then things will really improve. Until then we shall have to be content to sit still and see that objectionable British characteristic of belittling ourselves to the glorification of the foreigner work untold harm to our prestige.

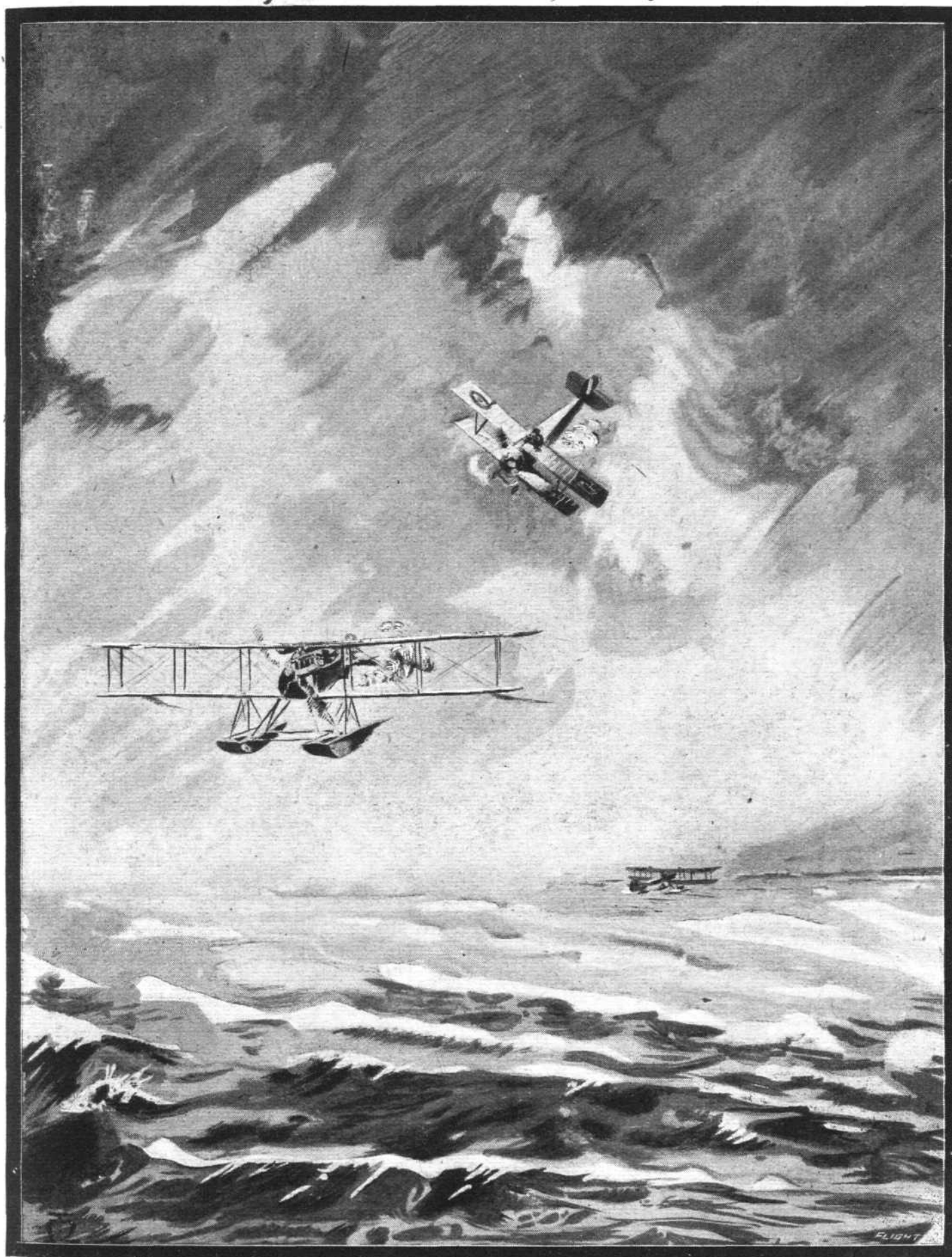
In this matter of airmen and aircraft, there is not the slightest doubt that the former are at least as good as any the world can show. As for the latter, if the whole truth were told it would be that British designs and British construction are very far ahead of everything else.

#### The First-Class Air Fighter.

Widespread interest has been aroused by an article in the *Daily Mail* by Mr. H. G. Wells, on this subject. The burden of his argument is that we should strain every effort to discover and train the material that lies latent among the youth of the country, ready and waiting when opportunity is given to develop into first-class air fighters. He believes that, if we only had a real system of selection, we could put up ten first-class pilots to every one of the Germans and could sweep the latter clean out of the air.

We shall not quarrel with his proportion, because we really believe he does not overstate the case, and we are absolutely in agreement with him as to the





**ATTACK AND COUNTER-ATTACK.**—An incident off the Belgian coast. A British pilot recently related the following scouting incident: "When returning from a bombing expedition along the Belgian coast my engine petered out, thus compelling me to come down. Immediately a wily Hun seaplane spotted me. Whirling and skimming around, he peppered me with his machine gun. My escort fortunately arrived in the nick of time, and then a thrilling combat ensued. Up and down the aerial staircase they went, with my escort hanging on to the Hun's tail, just like a couple of sparrows after a crumb. Finally, after exhausting his ammunition, the Hun waved his hand and wished us good-day."

need of some better system of selection than we have at present. Major Baird, the Parliamentary Secretary of the Air Board, claims that his department is sparing no effort to obtain more and more first-class air fighters. "We are only too anxious," he says, "to find, train and use everyone who has the rare and peculiar gifts for this service, irrespective of social position or any other secondary issue." That sounds very well on paper, and we do not for a moment presume to question the good faith of the statement so far as the Air Board is concerned, but there is little doubt of the fact that many good pilots are being lost to the service because of their want of social standing or because for some other purely personal reason, unconnected altogether with their ability, they do not commend themselves for commissioned rank to those in immediate authority over them.

We agree that the whole problem is an exceedingly difficult one for which to find a satisfactory solution, but if only a partial solution can be found we shall have done at least something that will be better than the want of system which is characteristic of the present process of selection. One way in which such a partial solution may be found is by throwing open generously the pilot ranks of both flying services to the ranks instead of, as at present, practically closing them to all but commissioned officers. The way the system works at the moment is this:—The junior commissioned officer of a line unit, for example, who aspires to become a pilot, can, as a rule, get his application for transfer forwarded to the proper quarter with next to no difficulty. Sometimes, it is true, he is so good a regimental officer that his commanding officer jibs at letting him go, but even in this case, if the prospective candidate for flying service persists in his application it must, under the regulations, be sent on. The rest is comparatively easy, and, if he shows the proper degree of skill and aptitude, he will have become a qualified pilot almost before he knows it. But the case of the man in the ranks afflicted with a similar desire is quite different. To put the matter in as few words as possible, his application for a probationary rank, or in the case of the Army for admission to an R.F.C. cadet unit, seldom meets with encouragement unless he can get it backed by someone whose word is likely to carry influence with his commanding officer. That is not at all as it should be. It would be far better if every application, except in the comparatively rare cases where the application is made for vexatious purposes, or where the candidate is manifestly unfitted for command, should be forwarded and dealt with by the proper authority. Where for either of the reasons given the application is not entertained by the man's commanding officer the latter should be called upon to furnish a clear statement of why it has been refused.

"One Air Service;  
One Uniform;  
One Badge."

According to report, Mr. Lloyd George and General Smuts, on behalf of the War Cabinet, are proceeding personally with the establishment and organisation of an Air Ministry, in connection with which an Air Operations Board will be a part. Report again says that it is on high authority that this announcement is made, so it may be taken there is more behind it than mere rumour. Doubtless it is too soon for the public

to be told exactly what shape this new organisation of our air forces is to take, but we may observe in passing that, as we have pointed out many times, there is only one ideal to be pursued and that is contained in the simple formula which heads this article. As a matter of fact, a writer in one of the Sunday journals says boldly that the "Imperial Air Service" will soon be in being and that it will be separate from the Navy and Army, though it will work in conjunction with both. Whether the writer in question is speaking from exact knowledge or whether once more it is a case of intelligent anticipation, we do not know, nor does it, for the moment matter. The principal thing is that, apparently the move for which "FLIGHT" has pleaded and agitated for years past is at last to be consummated.

We have never wavered from the belief that the creation of such a Service is the one and only way in which real efficiency can be secured. Aviation has already become such an enormous part of our system of defence and offence that it can no longer be allowed to remain the handmaiden of other Services with which, administratively, it has little in common, and which in the years to come it bids fair to leave far behind as a factor in military supremacy. It has no more in common with those Services than the Navy has with the Army, save that it, like them, is an integral part of the whole grand military system. It, again like them, must stand on its own feet and must develop along its own lines in readiness to co-operate either with land or sea power, but ready and organised to make and decide war, if necessary, without help or co-operation from either. As it is possible—or was until aviation came to change the face of war—for campaigns to be exclusively military or naval, so we must contemplate that in the future there may be wars in which no shot will be fired except from the air. To some who are bound by the traditions of the past this may seem to be venturing too far into the realm of prophecy, but when we regard the progress that has already been made and the further development which is even now in sight, we take leave to say that it does not err. Allowing that it does not, the apart altogether from immediately pressing considerations, of which there are enough and to spare that alone is sufficient to make out the case for separate Air Service we have advocated for so long and which now seems to be in sight. But it need not to dip into the future for our arguments. We have set forth the case for "One Air Service; One Uniform; One Badge," so often and at such length that we feel we need not traverse the ground again

#### National Aerial Policy.

It may perhaps be thought by some who have not closely followed the trend of development that we are inclined to attach too much importance to the separation of the Air Services from the Army and Navy, and that, given a better policy of "gingering up" production, the desired ends could be just as well achieved under the existing organisation by a new and separate Air Service. The answer to this is very well summarised in an interview with Mr. Holt Thomas, published in a recent issue of the *Evening Standard*. How is it, he was asked, have we not sufficient machines to supply the front and at the same time bomb the German cities? The answer was "that our military policy is super"



the naval policy also—but we have no aerial policy. The Air Board since it came into existence has done, and is doing, wonders in increasing production. Its efforts could not be bettered. But that does not mean a national policy." Exactly—that is the crux of the whole matter. It does not avail to speed

up production and to hold ample reserves of machines and engines in hand unless there is a policy behind the productive organisation, making for their proper employment. That is what we have never had, but in the light of new developments we are justified in the hope and belief that this is an error of the past.



## HONOURS.

### Honours for the R.F.C.

It was announced in the *London Gazette* of September 26th that the King has been pleased to confer the following rewards for gallantry and distinguished service in the field. The acts of gallantry for which the decorations have been awarded will be announced as early as practicable:—

#### Military Cross.

Lieut. D. L. BURGESS, Can. Inf., attd. R.F.C.  
Lieut. G. C. ROGERS, Can. Inf., attd. R.F.C.

#### Military Medal.

869 Q.M. Sergt. W. W. CLARK, R.F.C.  
77335 Sergt. C. R. GOFFE, R.F.C.  
2866 Sergt. L. A. HERBERT, R.F.C.  
4111 1st Air-Mech. P. F. HOOKER, R.F.C.

1182 1st Air-Mech. C. E. HYDE, R.F.C.  
104 Flight Sergt. A. F. NETHEY, R.F.C.  
393 Corpl. J. P. POWELL, R.F.C.  
328 Sergt. H. O. SMITH, R.F.C.  
2707 Corpl. L. VAN SCHAICK, R.F.C.

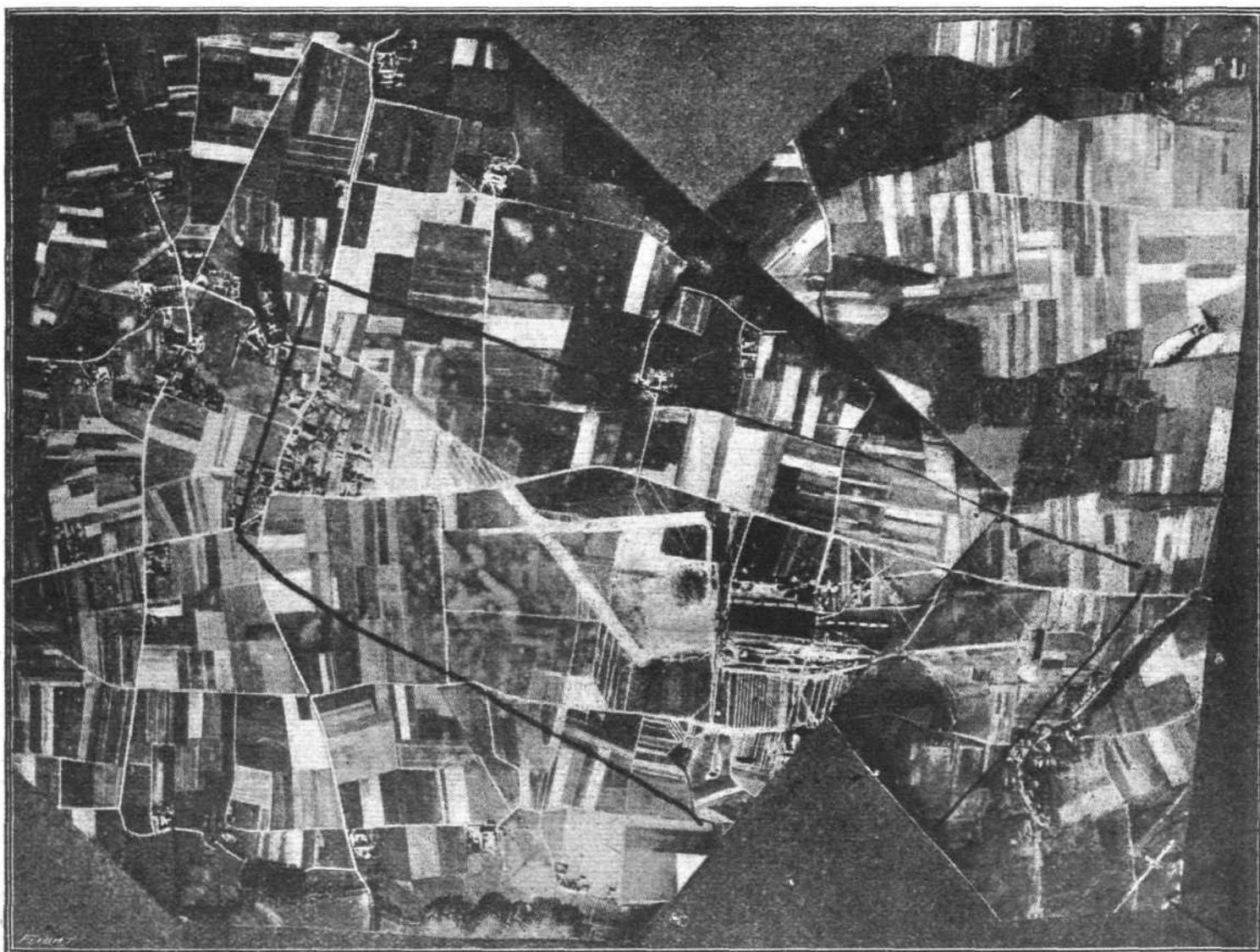
### Serbian Honour for R.F.C. Officer.

It was announced in the *London Gazette* of October 3rd that the King of Serbia has conferred the following decoration for distinguished services rendered during the course of the campaign:—

#### ORDER OF THE WHITE EAGLE.

##### 4th Class (with Swords).

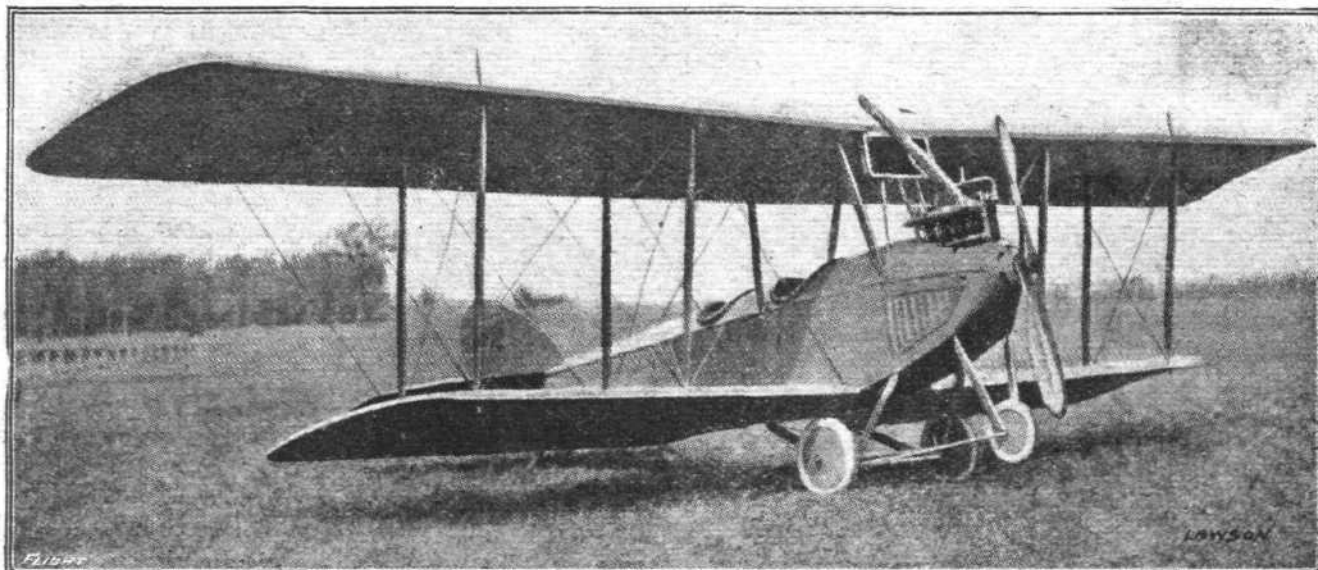
Temp. 2nd Lieut. (temp. Capt.) G. W. M. GREEN, D.S.O., M.C., General List and R.F.C.



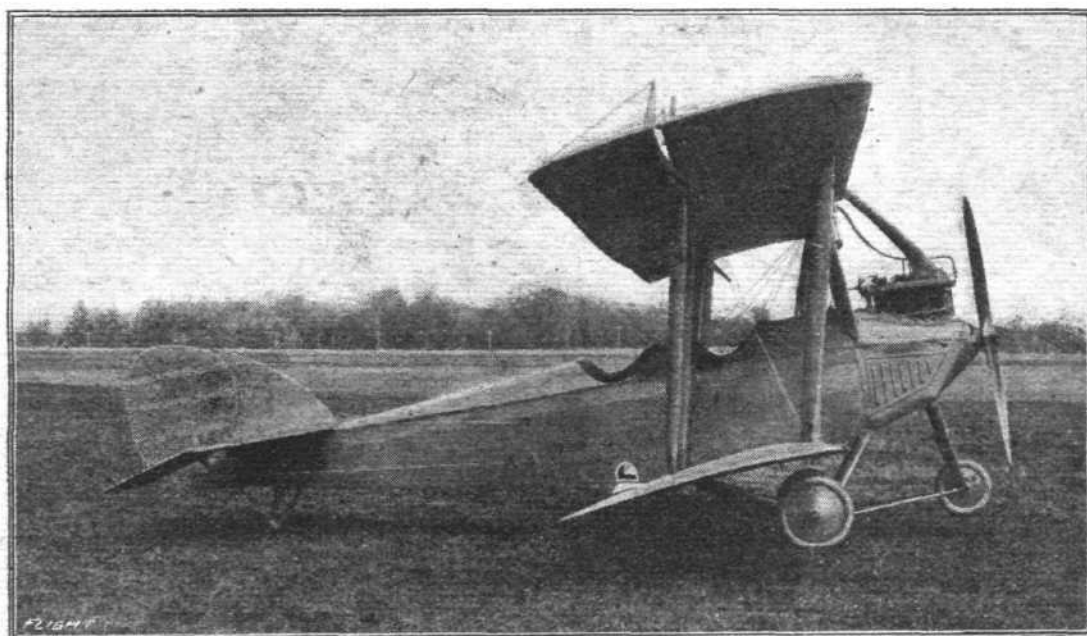
*Press Bureau Official Photograph.*

**HOW OUR AIR SERVICES ARE STRAFING THE ENEMY-OCCUPIED COUNTRY.**—A photograph of Gontrode Aerodrome taken on September 27th from one of our fighting aeroplanes. Note bomb dropping from aeroplane at right hand side of photograph. Also note bomb craters and hole in hangar caused by another bomb. The aeroplanes will be noticed outside the hangar, no doubt owing to the damaged state of the building, and to spread the risk during further attacks.

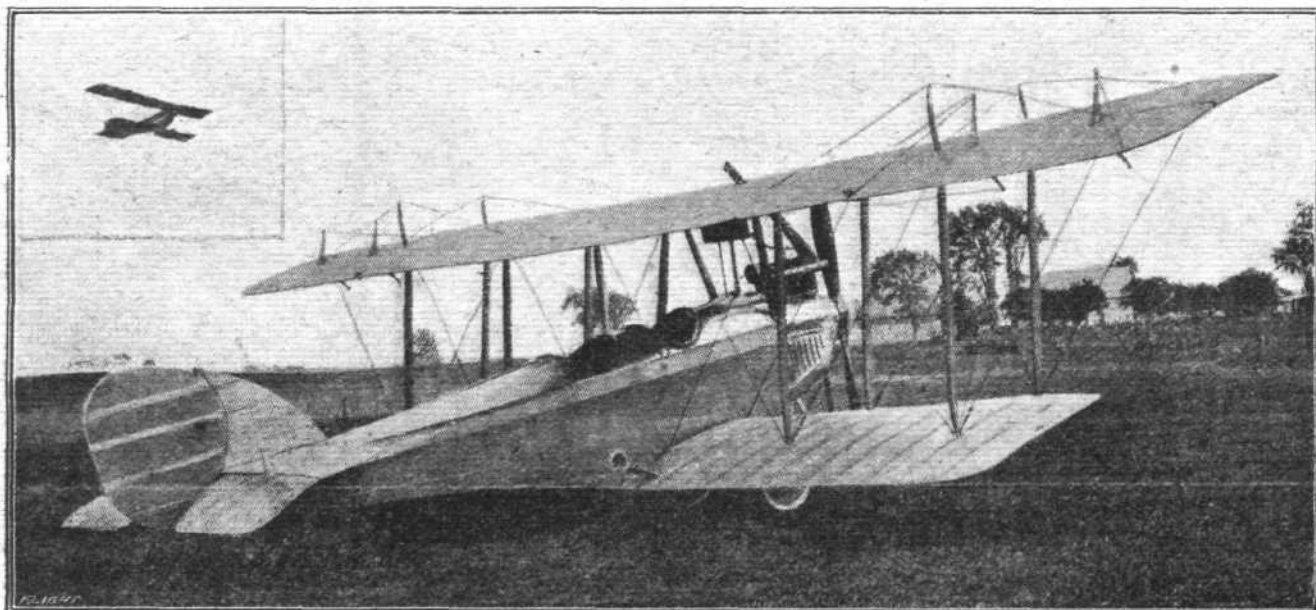
# THE LAWSON TRAINING TRACTOR BIPLANE.



Three-quarter front view of the Lawson training tractor biplane.



Side view of the Lawson primary training tractor biplane.



Three-quarter rear view of the Lawson training tractor biplane. Inset, the machine in flight.



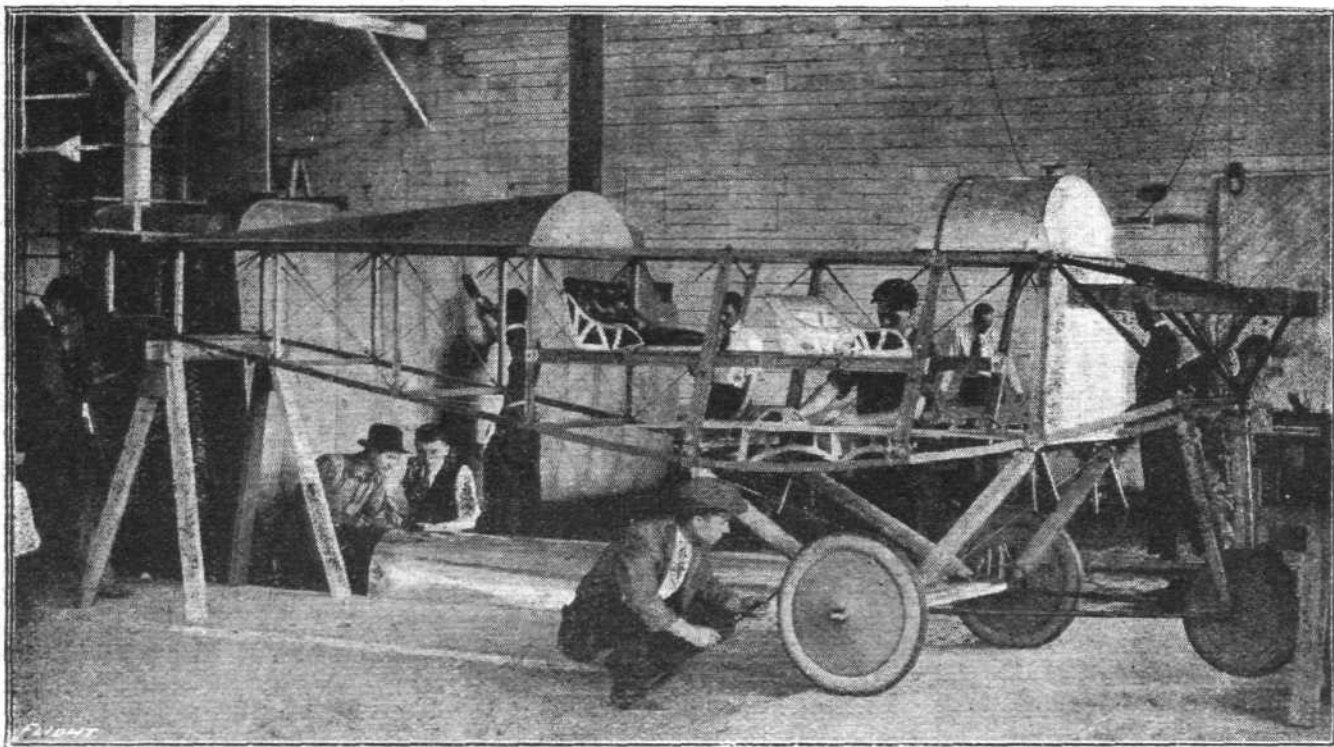
## THE LAWSON TRAINING TRACTOR BIPLANE.

We have just received from the Lawson Aircraft Corporation, of Green Bay, Wis., U.S.A., the accompanying illustrations and particulars of a decidedly businesslike-looking tractor biplane recently completed at their works. This machine is of the primary training type, built to conform with the specifications No. 1,000 issued by the U.S. Army.

Besides several important constructional features—details of which we are not for the present at liberty to disclose—the Lawson tractor possesses the following features valuable to machines of this type: Its minimum flying speed is as

with sheet metal. The tandem seats are mounted on stout longitudinals carried by second, third and fourth sets of upright struts. Dual stick control is installed.

The engine is a 100 h.p. Hall-Scott model A-7A, coupled direct to an 8-ft. diameter tractor screw having an 8-in. pitch. The engine mounting consists of two stout bearers, supported by a system of tubular stays, as shown. The radiator is mounted above the engine underneath the leading edge of the top plane. The exhaust pipe extends upwards and rearwards over the top plane.



A view of the uncovered fuselage of the Lawson primary training tractor biplane.

low as 37 m.p.h., whilst the maximum speed is 75 m.p.h. The landing chassis is extremely strong and the axle carrying the two main wheels is well sprung, allowing the axle a wide range of action vertically between the guide plates, which may be seen in the view of the uncovered fuselage. A third, additional, wheel mounted in front of the other two, provides against the machine turning over on its nose should the pupil land the machine at too sharp an angle.

As may be seen, the fuselage, which is a little over 25 ft. in length, is of rectangular section, with spruce longerons and struts, and wire bracing. It is covered with Irish linen as far as the engine housing, which latter part is covered

On its first flight, under the pilotage of Mr. Alfred Lawson, the machine left the ground after a run of 40 ft., and when landing stopped within 70 ft. of first point of contact.

The main characteristics of the Lawson tractor are as follows:—

Span, (top) 44 ft. 6 ins., (bottom) 32 ft. 6 ins.; chord, (top) 7 ft., (bottom) 6 ft. 5 ins.; gap, 6 ft. 9 ins.; stagger, 9°; dihedral angle, 1°; wing section, U.S.A.3; angle of incidence, 4½°; overall length, 25 ft. 6 ins.; height, 10 ft.; weight, empty, 1,300 lbs.; useful load, 600 lbs.; loading, 4.5 lbs. per square foot; speed range, 37-75 m.p.h.; climb, 2,600 ft. in 10 minutes; gliding angle, 1 in 10.

### London Boroughs and Air Policy.

At a meeting of Metropolitan mayors, held at the Westminster City Hall on October 4th, and presided over by the Mayor of Westminster (Sir George Welby), the following resolutions were passed with regard to reprisals and raid warnings:—

1. That the day system of warnings should be extended throughout the night.
2. That an air offensive on the largest possible scale should be undertaken forthwith against German cities and towns without distinction.
3. That in the opinion of this meeting the Air Services of the country should be unified and placed under one responsible head.

### The Defence of London.

SPEAKING at a meeting at the Poplar Town Hall, on October 8th, Lieut.-Gen. Sir Francis Lloyd, referring to the anti-aircraft defences of London, said we were getting more lights, more guns, and more ammunition. People should remember when air raids were on that the terrible barrage put up was their very best friend. As to our own airmen, they were incomparable. They were in the zone of fire, he imagined they were up there somewhere ready to pick up the German flyers and fight them immediately they saw them. There was not one of our airmen who, the moment he saw an enemy machine, was not ready to fight it for all he was worth. Sir

Francis urged the necessity of taking shelter. "Do not do," he advised, "what I am afraid I did: go and look out to see what is going on." Something has been said about the dangers of "tubes." His advice was to go down into the "tubes." We are doing our very best to increase our powers of defence by more guns, more lights, which are very essential in attacking aeroplanes. "We have no experience yet of the enemy coming on dark nights. I very much doubt his being able to do so, but the possibilities of the future are infinite, and it is impossible to say what he may do. I am glad to say, however, that at present, so far as we know, we are pretty safe on dark nights and with bad weather."

A member of the audience inquired whether the country was being humbugged over reprisals, and whether German influence was too strong for the Government to institute reprisals. Why had the Government allowed all the moonlight to go without taking reprisals? "I would like a straight answer," he demanded.

Sir Francis replied that he was not a politician, nor was he in the Government. They had heard what the Prime Minister was reported to have said the other day. "We will give them hell." "I hope he means it. I fancy he does; but I have nothing to do with it. I do fancy, though, that there is every intention of having a go at them now straight away. Recently we dropped hundreds of tons of bombs behind the lines, and I expect that before long we shall hear of very big raids."

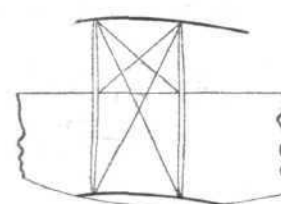
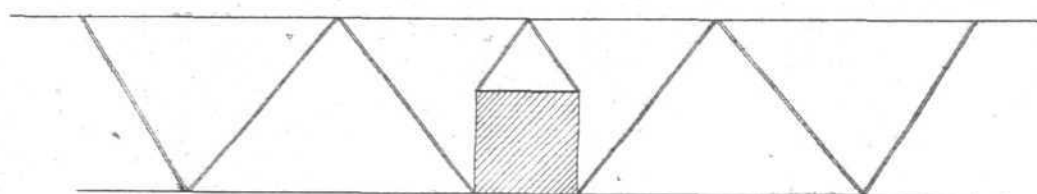
# WING BRACING AND HEAD RESISTANCE.

By MARCO POLO.

(Continued from page 1023.)

WHEN that old pioneer of aviation, Chanute, and after him the Wright Brothers, first took to employing super-imposed planes for their gliders, the question of weight naturally appeared to them, as indeed it was for such low speeds as were then contemplated, of greater importance than that of head resistance. In consequence, the method of wing bracing that would seem most obvious—from the point of view of weight/strength ratio was chosen, and this was quite naturally in the form of wood struts and piano wire ties. In the early days the builders of aircraft were not necessarily trained structural engineers, and hence those early biplanes presented a veritable maze of wires, many of which,

of the usual vertical struts and diagonal ties, of a series of slanting struts, which may act as struts at one time and as ties at another, according to the nature of the loading.—The Albatros biplanes of this type did not, as far as one knows, meet with any great success, why is not quite clear. The objections to it may have been practical ones, such as a certain difficulty in designing a simple and neat fitting for attaching the ends of the struts to the wing spars. On the other hand it may be that the resistance offered by such a structure was greater, strength for strength, than that of the ordinary vertical-strut-and-wire-tie type. Since, on the face of it, this girder would appear to possess certain



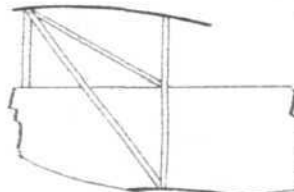
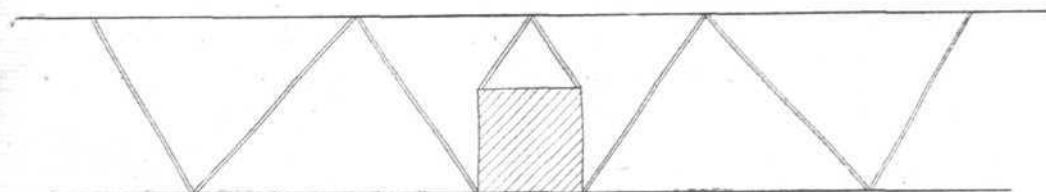
TYPE W	UPPER WING	LOWER WING
SPAN	30'-0"	26'-0"
CHORD	5'-0"	5'-0"
AREA	150 sq. ft.	115 sq. ft.
TOTAL AREA	265 sq. ft.	
GAP:	5'-0"	
TOTAL LENGTH OF		
STRUTS:	85'-4"	
WIRES:	93'-4"	
RESISTANCE FACTOR	264	

Fig. 6.—Diagram of the wing bracing of a Warren truss arrangement.

it was later found, were doing absolutely no useful work at all. For instance, it was no uncommon thing in those days—except in so far as it was certainly somewhat out of the ordinary to see an aeroplane at all—to find bracing wires running from the top of an inter-plane rear strut to the bottom of the next inter-plane front strut. Gradually, however, it was discovered that some of these wires could very well be done without, and finally it came to be accepted as a general rule that diagonal wires between the rear struts, diagonal wires between the front struts, and diagonal wires connecting the tops and bottoms respectively of the front and rear struts that formed a pair—what we now generally term incidence wires—were all that was required for the external bracing of the wings. For a number of years this type of bracing was adhered to practically without exception, and came to form a common feature of all biplanes, no matter however much

advantages it may be of interest to make an estimate in order to see how its "Resistance Factor" would compare with the others examined in these notes.

In Fig. 6 is shown diagrammatically a Warren truss wing bracing. The form of this truss might vary as regards the disposition of the struts, but the arrangement shown is that which most obviously suggests itself. The centre of the top plane is supported on a four-legged cabane in the usual way, but the first inter-plane strut slopes outward from the junction of the bottom plane to the lower longerons, in the precise position, in fact, usually occupied by the first lift wire, the function of which the strut performs. The next strut slopes from the top plane outwards to the point where ordinarily the vertical struts would be attached to the bottom plane, while the last strut supports the upper wing tip, acting as a lift wire when the machine is in the air.



TYPE	UPPER WING	LOWER WING
SPAN	30'-0"	28'-0"
CHORD	5'-11"	3'-6"
AREA	177 sq. ft.	88 sq. ft.
TOTAL AREA	265 sq. ft.	
GAP	5'-0"	
TOTAL LENGTH OF		
STRUTS	103'-6"	
WIRES		
RESISTANCE FACTOR 207		

Fig. 7.—Diagram of combined Warren and Nieuport wing bracing.

they might differ in other respects. Exceptions there were, of course, as for instance the Breguet's, which employed only a single strut and correspondingly simple wire bracing.

From time to time attempts were made to introduce something different from the strut-and-wire bracing, but with scant success. The German Albatros firm introduced—quite a number of years ago, the writer does not at the moment call to mind the exact date—a biplane with what is, I believe, known in other branches of structural engineering as the Warren truss girder. This consists, instead

When measuring up the total length of struts this is found to be 85 ft. 4 ins., including, of course, the struts of the cabane. The total length of wires amounts to 93 ft. 4 in., assuming that two incidence wires are employed in each bay. If desired to turn the structure into a "wireless" one this might, of course, be done by fitting one diagonal strut instead of two incidence wires, and as it has been assumed that the resistance of a strut is twice as great per foot run as that of a stream line cable, this alteration would not affect the resistance. Finally, adding up it is found that the resistance factor for a machine



of the proportions chosen and having an area of 265 sq. ft. would be no less than 264, or only very slightly better than the ordinary two struts a side arrangement as exemplified by the Halberstadt, for which, it may be remembered, a resistance factor of 283 was found. The Albatros referred to was of the two-strut type, and as the gain in resistance was negligible while there were certain practical difficulties to be overcome, as already mentioned, this may be the reason why that particular type of Albatros was not perpetuated.

While on the subject of Warren trusses it may be of interest to examine whether possibly there might be any gain obtainable by combining the Warren truss and the Nieuport type bracing, that is to say retain the Vee arrangement of the struts, but substituting struts of this formation for the ordinary lift wires of the Nieuport. This arrangement is indicated in Fig. 7. As in the previous case the centre of the top plane has been assumed to be mounted on a cabane, while the Nieuport Vee struts have been arranged in the formation of the Warren truss. Structurally the disposition would have the disadvantage referred to in dealing with the standard Nieuport bracing that the travel of the centre of pressure on the top plane would increase the loading on the internal drift wires in the lower plane. Pos-

excessive head resistance, but if this could be reduced the arrangement seems to have possibilities. Reference has already been made to the "K" and "I" struts (in connection with the Curtiss "wireless" scout), and either of these or some variation of them would appear to offer the most obvious solution of the problem of reducing the head resistance of the Warren truss. As previously pointed out, wood, although very strong under tension, is somewhat difficult to design a suitable terminal fitting for, hence for the Warren truss, where the struts may resist tensile and compressive stresses alternately, the plain solid or even laminated strut may not be the most suitable. In the Curtiss "K" strut we have an example of the built-up strut, in which it would be possible—whether this is actually done the writer does not know—to use tubular or channel members to form the edges of the strut and to receive at their ends the terminal fitting attaching the struts to the wing spars. Another alternative would be to make the "I" struts out of pressed steel in two halves welded together along front and rear edges. Possibly it might be found in practice to be desirable to somewhat strengthen the thin shell forming the strut by internal stiffening pieces. This, however, is a matter for the individual designer to ascertain by calculations and practical experiments. What

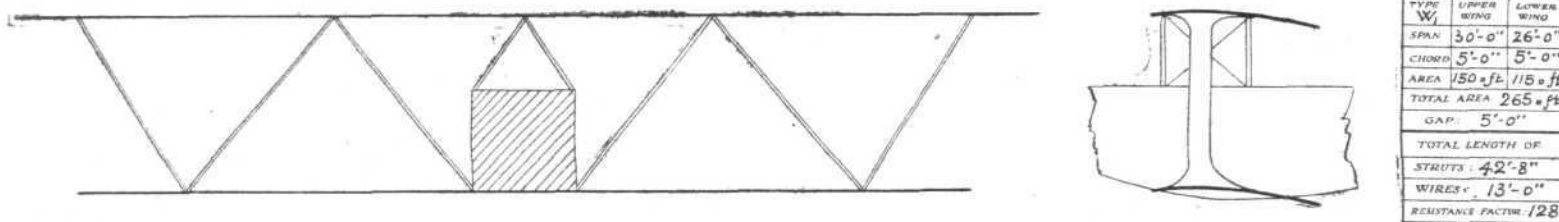


Fig. 8.—Diagram of simplified Warren truss wing bracing.

sibly, by building the bottom plane with two spars instead of one, and attach the apices of the Vees to a compression strut connecting front and rear spars, the lower plane might be strengthened to safely withstand this extra load, if the arrangement appears advantageous from other considerations. From the table in Fig. 7 it will be seen that the total length of struts is 103 ft. 6 ins., giving a resistance factor of 207, which is not quite so good as that found for the standard Nieuport (173.3). On the other hand, the free length of spar and overhang are considerably reduced in the case of the top plane, while remaining the same for the bottom plane. Possibly for a machine of such small size as the Nieuport, the original Nieuport bracing would be deemed the better, everything considered, while for the area chosen for these comparative notes or for larger machines the Warren-Nieuport combination would have certain advantages that might conceivably be found in practice to outweigh the difficulty of providing adequate drift bracing in the lower plane. The gain either way would not appear to be very important.

There is one development of the Warren truss which the writer has not yet seen on any aeroplane, but which would appear to possess certain not inconsiderable merits. It was found that the resistance of a Warren truss as that shown in Fig. 6 had an

concerns us in the present notes is the question how such a structure would compare, as regards head resistance, with other forms.

Fig. 8 is a diagram of such a wing bracing. The struts are shown in the side view to be of the "I" type, although, of course, any other form that might be found suitable could be substituted. From the table it will be seen that the total length of struts is 42 ft. 8 in. This is made up of 37 ft. 8 in. of inter-plane struts and 5 ft. of body struts. Assuming as before that the plane struts will have a resistance of 2.5 that of the stream-lined cable (in view of the fact that they are to be of the "I," "K," or "X" type), while the body struts are to be of the ordinary plain type and will, therefore, be assumed to have a resistance of twice that of the cable, we arrive at a resistance factor of 128. With the exception of the Curtiss "wireless" this is the lowest resistance factor found so far for a machine of this area, the next best being the Nieuport type, with a resistance factor of 173.3. It would therefore appear that provided the struts can be designed to transmit tension satisfactorily, and the internal drift bracing to take care of the drift, this form of bracing would be quite good. If the struts were carefully made there should be practically no "tuning up" required, since true alignment would follow automatically in erecting. (To be continued.)

#### To Readers—One and All.

THE Editor of "FLIGHT" will at all times be pleased to consider original articles (illustrated or otherwise) on subjects directly or indirectly allied with aviation. All articles

accepted will be paid for; a high literary standard of writing is not essential; it is the facts which matter. Practical explanatory articles are most acceptable. Diagrams and similar illustrations need only be rough sketches if necessary.

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Total, October 9th, 1917 .. .. 12,324 6 11

H. E. PERRIN, Secretary.

3, Clifford Street, New Bond Street, W. 1.

## THE ROLL OF HONOUR.

### REPORTED by the Admiralty:—

#### Previously Missing, now reported Killed.

Flight Sub-Lieut. E. C. Hillaby, R.N.  
Flight Sub-Lieut. K. H. Millward, R.N.  
Flight Sub-Lieut. D. W. Ramsay, R.N.  
Flight Lieut. F. P. Reeves, R.N.

#### Died of Wounds.

Flight Sub-Lieut. W. J. Beattie, R.N.  
Sub-Lieut. B. D. Laughton, R.N.V.R. (R.N.D.), attd. R.F.C.

#### Died of Injuries.

Flight Comdr. J. D. Newberry, R.N.

#### Died.

Lieut. R. Oliver, R.N.V.R.

#### Accidentally Drowned.

Flight Sub-Lieut. J. D. Grant, R.N.

### Previously reported Missing, now presumed Killed.

Midshipman J. Barber, R.N.R.  
Flight Lieut. C. A. Eyre, R.N.  
Flight Sub-Lieut. J. J. de la T. Fox, R.N.  
Flight Sub-Lieut. E. H. Kendall, R.N.  
Flight Sub-Lieut. T. C. May, R.N.  
Flight Sub-Lieut. E. V. Reid, D.S.C., R.N.  
Flight Sub-Lieut. G. Roach, R.N.  
Flight Sub-Lieut. H. D. Smith, R.N.

#### Missing, believed Killed.

Flight Sub-Lieut. E. J. K. Buckley, R.N.  
Flight Sub-Lieut. K. V. Turney, R.N.

#### Wounded.

Flight Sub-Lieut. C. E. Bramhall, R.N.  
Sub-Lieut. B. D. Laughton, R.N.V.R., R.N.D., attd. R.F.C.  
Lieut. C. G. Tufton, R.M.A.

#### Slightly Wounded.

Flight Comdr. R. J. O. Compston, D.S.C., R.N.  
Lieut. H. Duveen, R.N.V.R.

#### Seriously Injured.

Prob. Flight Officer B. J. E. Anson, R.N.

### Previously Missing, now reported Prisoner.

Flight Sub-Lieut. H. H. Booth, R.N.

#### Prisoners.

Flight Lieut. J. W. Alcock, R.N.  
Flight Lieut. H. R. Aird, R.N.  
Mr. S. J. Wise, Warrant Officer, R.N.A.S.

### Reported by the War Office:—

#### Killed.

2nd Lieut. J. B. Bailey, E. Yorks., attd. R.F.C.

2nd Lieut. J. L. Barlow, R.F.C.  
2nd Lieut. F. J. Chown, R.F.C.  
Lieut. H. L. A. Devlin, A. and S. Hrs. and R.F.C.  
2nd Lieut. A. H. Gilbert, R.F.C.  
2nd Lieut. E. Holdsworth, R.F.C.  
2nd Lieut. J. MacHaffie, R.F.C.  
2nd Lieut. R. D. W. McKergow, Dgn. Gds., attd. R.F.C.  
2nd Lieut. G. W. McKenzie, R.F.C.  
Lieut. J. A. Menzies, Cent. Ont., attd. R.F.C.  
2nd Lieut. C. McK. Payne, R.F.C.  
Lieut. B. W. Ryan, Can. Eng., attd. R.F.C.  
Lieut. N. Sharples, R.F.C.  
2nd Lieut. S. M. Spurway, R.F.C.  
Major G. B. Ward, M.C., R.F.C.  
2nd Lieut. J. Worstenholm, R.F.C.

### Previously Missing, now reported Killed.

2nd Lieut. D. J. de A. Bird, R.F.A., attd. R.F.C.  
2nd Lieut. G. W. Jackson, North'd F., attd. R.F.C.  
2nd Lieut. A. H. Margoliouth, Yorks L.I. and R.F.C.  
2nd Lieut. B. W. Pitt, R.F.C.  
Capt. H. E. Read, Yeo., attd. R.F.C.  
Lieut. J. R. Robertson, Yeo. and R.F.C.

### Previously Missing, now Missing, believed Killed.

61925 Sergt. W. A. Barnes, R.F.C.  
1897 1st Air-Mech. P. Bonner, R.F.C.  
65251 Sergt. J. F. Carr, R.F.C.  
46133 2nd Air-Mech. A. W. Ekins, R.F.C.  
P/4567 2nd Air-Mech. E. Gilchrist, R.F.C.  
1130 1st Air-Mech. F. Russell, R.F.C.  
3223 Corpl. G. Stewart, R.F.C.  
27234 Actg. Sergt. W. S. Wickham, R.F.C.  
61869 2nd Air-Mech. E. Wood, R.F.C.

#### Died of Wounds.

Lieut. M. Bevan, Cent. Ont., attd. R.F.C.  
Lieut. F. Bullock-Webster, Can. M.G.C., attd. R.F.C.  
77451 Sergt. W. Studholme, R.F.C.

### Accidentally Killed.

48564 1st Air-Mech. H. Crookes, R.F.C.

#### Died.

30241 2nd Air-Mech. R. Blight, R.F.C.  
49630 1st Air-Mech. R. Harris, R.F.C.  
19737 1st Air-Mech. J. W. Payne, R.F.C.  
959 E. J. C. Treadwell, Aus. F.C.

#### Wounded.

2nd Lieut. P. H. Baker, R.F.C.  
2nd Lieut. W. F. de V. Bealey, N. Staffs., attd. R.F.C.  
2nd Lieut. F. H. Bickerton, R.F.C.  
2nd Lieut. A. N. Burrow, R.F.C.



2nd Lieut. L. A. Bushe, R.F.C.  
 2nd Lieut. D. W. T. Cain, R.F.C.  
 2nd Lieut. A. A. English, M.C., R.E., attd. R.F.C.  
 2nd Lieut. C. J. G. Etheridge, Yorks. L.I., attd. R.F.C.  
 Capt. C. H. Gardner, R.F.A., attd. R.F.C.  
 2nd Lieut. W. Grossmith, R.F.A., attd. R.F.C.  
 Lieut. W. V. Hyde, R. Innis. F., attd. R.F.C.  
 Lieut. W. Jones, R.F.C.  
 Lieut. G. C. Langford, Can. F.A., attd. R.F.C.  
 2nd Lieut. H. D. Layfield, R.F.C.  
 2nd Lieut. J. C. MacGregor, R.F.C.  
 Lieut. L. G. Macklin, Shrops. L.I., attd. R.F.C.  
 Lieut. F. L. McCreary, S. Lanes., attd. R.F.C.  
 Lieut. W. M. Miller, Yeo. attd. R.F.C.  
 2nd Lieut. A. A. N. Pentland, R.F.C.  
 Lieut. A. P. Prior, S. Staffs, attd. R.F.C.  
 2nd Lieut. J. R. M. Simpson, R.F.C.  
 2nd Lieut. B. S. Smallman, R.F.A., attd. R.F.C.  
 2nd Lieut. P. W. Smith, Yeo., attd. R.F.C.  
 2nd Lieut. L. V. Thorowgood, R.F.C.  
 2nd Lieut. G. D. Turner, Welsh, attd. R.F.C.  
 2nd Lieut. R. J. Underhill, R.F.C.  
 Lieut. N. E. Wallace, Can. F.A., attd. R.F.C.  
 2nd Lieut. F. P. Watts, R.F.C.  
 Lieut. G. F. W. Zimmer, R.F.C.  
 5703 1st Air-Mech. G. F. Atkins, R.F.C.  
 8212 1st Air-Mech. A. W. Barnes, R.F.C.  
 2723 Corpl. J. C. Barras, R.F.C.  
 13411 2nd Air-Mech. F. W. Bates, R.F.C.  
 43690 2nd Air-Mech. A. Breare, R.F.C.  
 63754 2nd Air-Mech. G. C. E. Cooper, R.F.C.  
 56634 2nd Air-Mech. B. C. Fisher, R.F.C.  
 77335 Corpl. C. R. Goffe, R.F.C.  
 1163 Sergt. C. Jackson, R.F.C.  
 11363 2nd Air-Mech. J. J. Keene, R.F.C.  
 5081 1st Air-Mech. R. Lambert, R.F.C.  
 10026 2nd Air-Mech. E. W. Liddiard, R.F.C.  
 65054 2nd Air-Mech. J. McKillop, R.F.C.  
 P9273 2nd Air-Mech. E. Perrott, R.F.C.  
 43673 2nd Air-Mech. R. Scott, R.F.C.  
 8140 1st Air-Mech. C. W. Smith, R.F.C.

**Previously reported Prisoner, now reported Wounded and Prisoner in German hands.**

2nd Lieut. V. C. Coombs, R.F.C.

**Previously Missing, now reported Wounded and Prisoners in German hands.**

Lieut. A. F. Bird, Norf. R., attd. R.F.C.  
 2nd Lieut. W. E. B. Diamond, R.F.C.  
 Lieut. S. A. Harper, M.C., Ches. Regt., attd. R.F.C.  
 Lieut. J. B. C. Madge, R.F.C.  
 Lieut. K. W. McDonald, R.E., attd. R.F.C.  
 Lieut. J. W. F. Neill, R. Scots, attd. R.F.C.  
 Lieut. G. A. H. Parkes, R.F.C.  
 2nd Lieut. E. G. C. Quilter, R.F.C.  
 Capt. C. C. Sharp, R.F.C.  
 2nd Lieut. W. A. L. Spencer, R.F.C.  
 2nd Lieut. T. M. Webster, R.F.C.

**Missing.**

2nd Lieut. F. C. Andrews, R.F.C.  
 2nd Lieut. R. S. Asher, R.F.C.  
 Lieut. E. N. Baillon, Brit. C., attd. R.F.C.  
 2nd Lieut. G. R. Baynton, R.F.C.  
 2nd Lieut. E. A. Bell, R.F.C.  
 2nd Lieut. S. L. J. Bramley, R.F.C.  
 Lieut. W. A. Browne, R. Innis. Fus., attd. R.F.C.  
 2nd Lieut. E. A. Cooke, R.F.C.  
 2nd Lieut. W. O. Cornish, R.F.C.  
 2nd Lieut. S. L. Crowther, R.F.C.  
 2nd Lieut. R. L. Curtis, R.F.C.  
 Lieut. B. R. Davis, Royal Fus., attd. R.F.C.  
 2nd Lieut. J. M. de Lacey, W. York, attd. R.F.C.  
 2nd Lieut. C. C. Dennis, Lond. R., attd. R.F.C.  
 2nd Lieut. W. English, R.F.C.  
 2nd Lieut. T. B. Fenwick, R.F.C.  
 2nd Lieut. R. H. Garratt, R.F.C.  
 Lieut. W. H. R. Gould, R.F.C.  
 2nd Lieut. C. G. D. Gray, R.F.C.

2nd Lieut. T. Grosvenor, Linc. R., attd. R.F.C.  
 2nd Lieut. W. E. Hall, Lond. R. and R.F.C.  
 Capt. A. C. Hatfeild, R.F.C.  
 2nd Lieut. R. A. Inglis, R.F.C.  
 2nd Lieut. F. W. Kirby, R.F.C.  
 Capt. J. K. Law, R. Fus., attd. R.F.C.  
 2nd Lieut. C. N. L. Lomax, R.F.C.  
 2nd Lieut. R. R. McGregor, Royal Scots, attd. R.F.C.  
 2nd Lieut. T. W. McLean, R.F.C.  
 2nd Lieut. W. G. McRae, R.F.C.  
 Lieut. G. E. Mial-Smith, M.C., Norf., attd. R.F.C.  
 Capt. R. N. Mills, F., A.S.C., attd. R.F.C.  
 2nd Lieut. C. H. F. Nobbs, R.F.C.  
 2nd Lieut. R. E. Nowell, R.F.C.  
 2nd Lieut. A. I. Orr-Ewing, Yeo., attd. R.F.C.  
 Lieut. D. M. Paton, R.F.C.  
 Lieut. W. J. Potts, M.C., R.F.A., attd. R.F.C.  
 Lieut. B. A. Powers, Middx., attd. R.F.C.  
 2nd Lieut. C. F. Pritchard, R.F.C.  
 2nd Lieut. C. F. Risteen, R.F.C.  
 2nd Lieut. G. B. Roberts, R.F.C.  
 2nd Lieut. H. Rothery, R.F.C.  
 2nd Lieut. D. G. Rouquette, R.F.C.  
 2nd Lieut. C. E. Stuart, R.F.C.  
 2nd Lieut. A. L. Sutcliffe, S. Staff. R., attd. R.F.C.  
 2nd Lieut. A. Taylor, R.F.C.  
 2nd Lieut. H. V. Thompson, R.F.C.  
 2nd Lieut. D. P. FitzG. Uniacke, R. Ir. Rif., attd. R.F.C.  
 Lieut. J. O. Whiting, R.F.C.  
 Lieut. C. H. C. Woods, Can. A.S.C., attd. R.F.C.  
 23052 Corpl. H. G. Bessenger, R.F.C.  
 1166 Sergt. C. J. Comerford, R.F.C.  
 87597 2nd Air-Mech. E. Kelly, R.F.C.  
 78930 2nd Air-Mech. F. J. Smith, R.F.C.

**Previously Missing, now reported Prisoner of War.**

78530 2nd Air-Mech. C. Bemister, R.F.C.

**Previously Missing, now reported Prisoners in German hands.**

2nd Lieut. A. N. Barlow, R.F.C.  
 Lieut. A. E. S. Barton, R.F.A., attd. R.F.C.  
 Capt. D. P. Collis, R.F.C.  
 Lieut. W. D. Cullen, E. Surr. R., attd. R.F.C.  
 2nd Lieut. J. C. Huggard, R.F.C.  
 2nd Lieut. R. C. Hume, R.F.C.  
 Capt. R. T. Leighton, Yeo., attd. R.F.C.  
 2nd Lieut. J. M. Lovatt, N. Staff. R., attd. K.R. Rif. C.  
 Lieut. H. O. McDonald, R.F.C.  
 2nd Lieut. A. C. Pickett, R.F.C.  
 Lieut. N. C. Saward, R.F.A., attd. R.F.C.  
 2nd Lieut. F. Scarborough, R.F.A., attd. R.F.C.  
 2nd Lieut. A. T. K. Shipwright, R.F.C.  
 Lieut. C. D. Thompson, H.A.C., attd. R.F.C.  
 Lieut. C. B. Waters, Lond. R., attd. R.F.C.  
 2nd Lieut. L. Wigley, R.F.C.  
 Lieut. S. W. Williams, Ess. R., attd. R.F.C.

**Previously Unofficially, now Officially, reported Prisoner in Bulgarian hands.**

Lieut. A. Leslie-Moore, I.A.R.O., attd. F.F.C.

**Corrections.**

**Previously Missing, now reported Killed.**

2nd Lieut. D. J. de A. Bird, R.F.A. and R.F.C., *should read* Lieut. D. J. de A. Bird, R.F.A., and R.F.C.  
 Capt. G. L. Cruikshank, D.S.O., R.F.C., *should read* Capt. G. L. Cruikshank, D.S.O., M.C., Gord. Hrs., attd. R.F.C.

**Wounded.**

2nd Lieut. J. E. J. Skelton, R.F.C., *should read* 2nd Lieut. J. E. L. Skelton, R.F.C.

**Missing.**

2nd Lieut. G. C. Holman, R.F.C., *should read* Lieut. G. C. Holman, R.F.C.  
 2nd Lieut. E. E. F. Lloyd, Dragoon Gds., attd. R.F.C., *should read* 2nd Lieut. E. E. F. Loyd, Dragoon Gds., attd. R.F.C.



**Guynemer's Victor Killed.**

AN Elberfeld telegram to the *Cologne Gazette* states that the German officer who shot down Capt. Guynemer, was Flight Lieut. Wissemann, who himself has since been killed.

In his last letter to his parents, in which he described how he brought down Capt. Guynemer, Lieut. Wissemann wrote: "Do not be anxious, as I can never have a more dangerous enemy."

## GUYNEMER—AN APPRECIATION.

By the disappearance of Guynemer, champion aviator of France, the Allies have suffered a great loss. He flew well, shot well, and devoted the whole of his energy and enthusiasm to the carrying out of his duties, and these points explain the phenomenal success of his all-too-brief career. I have known him well since the early part of 1917. Whenever he had a few days' leave, or had occasion to come to Paris for a new Spad, or anything else connected with his military duties, he always stayed at the Hôtel Edouard VII., which has been my home for several months this year, and in this way we spent a good deal of time together. In many little characteristics he reminded me of Gustave Hamel, but most of all in his extreme shyness and dislike of publicity, and it may be opportune, therefore, to place on record a few personal impressions which may be of interest to those concerned with British aviation. For some of the particulars relating to his early days I am indebted to Comte Alain de Vergennes, an old schoolfellow, who has known Guynemer since he was seven years old.

Georges Guynemer was born at Compiègne twenty-three years ago. His parents have a charming country estate there, and I have already recorded in "FLIGHT" some months ago the interesting fact that his mother is a niece of Sir Walter Scott. Georges was the only son, and there are two daughters. The reference I noticed in one of the leading London dailies to his "aged parents" is as stupid and untrue as the statement that he was educated at Westminster—the latter perhaps arising out of the fact that Hamel was an old Westminster boy.

In his early days he developed a taste for higher mathematics, but being of a delicate and highly-strung constitution, his studies had to be checked, and at the outbreak of the war he was still at school and preparing to enter the banking profession. He at once endeavoured to enlist, but was repeatedly rejected on medical grounds, but his persistence eventually got him into the French Air Service as a mechanic. He had always been fond of mechanical affairs, and particularly of motor cycles and cars. Comte de Vergennes told me recently that only a few weeks ago it was arranged that he should drive Guynemer's car—a Hispano-Suiza—back to Paris from a certain aerodrome, after Guynemer had left by air for the front. Before starting the young pilot said to his friend, "Do you remember when I was a small boy at school and implored you to let me drive one of your new cars, and you refused, saying I was not strong enough? And now you are driving one of mine!"

Guynemer's wonderful enthusiasm attracted considerable attention, and it was not long before he secured permission to train as a pilot. I believe it was largely due to Jules Vedrines that he took his *brevet* on April 26th, 1915, after a very short course of training. His aptitude for the air was obvious from the first, and those who were closely watching his career were in no way surprised when he brought down his first Boche victim six weeks later in the neighbourhood of Soissons. After that event he was given a fast single-seater fighting machine, and since that date all his exploits have been on this type—practically all on a Spad. By the end of 1916 he had twenty-two victories standing officially to his credit.

By this time both he and his machine were well known to the Germans, but in spite of being "marked" he continued to add constantly to the long list of his successes, only once being wounded, in March, 1916, while assisting in the defence of Verdun. His many exploits have been recorded from time to time, and make thrilling reading. How he shot down three enemy machines one day in the course of a fight lasting only a few minutes, how he destroyed four others

in one day, and a score of other astonishing deeds of daring and skill, I will not attempt to describe now.

I have heard whispers of jealousy among other French aviators, but from personal knowledge I am glad to be able to dispose of these slanders. The members of the famous Storks' Squadron were all proud of him, and many, in fact, owe their lives to Guynemer, who came to their rescue at critical moments and drove their attackers away or sent them crashing to earth. At the date of his disappearance on September 11th, he had fifty-three victories to his credit, and it is reported that on the morning of his last flight he brought down two others.

His collection of orders and medals was unequalled. His Croix de Guerre had so many "palms" added that it became almost too unwieldy to wear. Many Allied nations presented him with decorations, one of his last being our own Distinguished Service Order, with which I happen to know he was particularly pleased. He made a special point of securing if possible some souvenir of each machine he destroyed, and these trophies—machine guns, instruments, engine parts, German flying caps, charts, and so on—now make a most imposing array on the main staircase of the house of his parents.

He had another and more sensational collection of souvenirs which I hope may be available for public inspection at some future date, and this collection consists of photographs of his victims taken in the course of his fighting. He devised an ingenious form of camera which was automatically worked by the firing mechanism of his gun, taking a series of photographs at intervals of so many seconds. As a result he obtained some photographs of German aeroplanes at the moment they were struck—fabric tearing off, parts flying, and sometimes flames just commencing to break out.

Guynemer was always intensely patriotic. I have known many occasions when he would curtail his brief leave in Paris because the weather seemed favourable for aerial activity. What leave he had he devoted mainly to matters connected with aviation. He would replenish his kit, and then hasten away to see the latest motor or the latest aeronautical instrument. In fact, his whole existence was centred on his work. In military details he was studiously correct. He had a horror of publicity, and if he chanced to meet a friend while motoring through Paris he would usually exchange a few words, and then, noticing the little crowd of admirers who would quickly congregate—for of course Guynemer was well known by sight—he would hastily fix a rendezvous at his hotel or elsewhere and then disappear.

Now there is very little doubt that he has disappeared for ever, but he leaves behind a record of brilliant work and self-sacrifice which in the history of aviation has no equal. He was really brave, for he had a delicate constitution and a vivid imagination, two items which would combine to give him a full appreciation of the dangers he faced, but he was quite content. He said early this year that if the war were over in six months he might hope to survive, but if it lasted longer he expected and was quite prepared to die fighting. He mentioned only a few weeks ago the case of a French pilot who was mortally wounded but managed by an almost superhuman effort to effect a landing behind the French lines before he died. Guynemer thought that was a magnificent thing, and said if it were at all possible he would do the same under similar circumstances, otherwise his friends might know, if he were missing, that he had been killed.

His demise is a great loss to the Allies, but his remarkable career will continue to be an inspiration to his brother aviators, as it has been since his first brilliant victory.

D. W. THORBURN.

### The Supremacy in the Air.

SPEAKING in one of the bombed districts on October 2nd, Dr. Addison, said the output of aeroplanes was being increased at a gigantic rate:—

"We have got the mastery of the submarine menace. We have done very well lately, and I am perfectly confident that before very long we shall achieve just as great supremacy in the air, whether over this country or over their own, as we have over the submarine menace. It is peculiarly hard that somehow or other this residential district should have been the victims of these raids. I want to make two observations. The first is, that I am quite aware that people are inclined to blame the Government because of these matters, but the air is a very big place, and Sir Francis Lloyd will tell you of some of the problems to be overcome in defending the coast and London. I am sure you will all have patience with the military authorities working out a scheme for

stopping these raids. Our airmen are brave enough to do anything.

"This question of defence is a colossal business, and the object of the enemy is to disturb the civil population. They know very well that they are doing no military damage, but what they want to do is to destroy the nerve of the civil population. Their sole hope is the destruction of British nerve at home so that we shall be unable to hang on long enough to see the armies in the field secure victory. You may say that this is small comfort to those who are being bombed. I agree, but I am sure that you will hang on long enough to see victory through. The defence of the past week shows an immense advance in our defensive plan."

Lieut.-General Sir Francis Lloyd, Director of the Defence of London, also addressed the meeting, and a resolution calling for reprisals, which was unanimously passed, Sir Francis promised to forward to the right quarter.



## GENERAL SMUTS ON REPRISALS.

ENTERTAINED at luncheon at the Connaught Rooms on October 4th by the Associated Chambers of Commerce, Lieut.-General J. C. Smuts, in the course of his speech, dealt at length with the question of reprisals. He said:—

"Defeated on the battlefield, baulked in his submarine campaign, the enemy is now in his impotent rage more and more striking at us through our non-combatants, through our women and children. At every opportunity bombs are being dropped on our towns and cities in order to strike terror to the hearts of our non-combatant population and to weaken and destroy the national spirit. Aerial warfare against the defenceless is the new weapon. I venture to predict that this weapon will not only fail, but prove a terrible boomerang to the enemy. You remember what happened to the Zeppelins; they visited our East coast and our towns and scattered bombs all the way. They were really more dangerous than the aeroplanes, and the casualties were higher than those sustained from the aeroplanes. But the population was determined to see the Zeppelin danger through, and where is the Zeppelin now? The Zeppelin was followed by aeroplanes in their day attacks, especially on London. But we took the measure also of this new opponent, and since last July no day attack has reached London. They may come again, but I am sure they will get the reception they deserve. Now the enemy has turned to night attacks, and it is possible that these attacks may continue and conceivably increase in the future. We are fully alive to the danger of these new attacks and the difficulty of meeting them. It must be pointed out that in spite of the most resolute defence on the Western front enemy machines continually bomb behind our lines at night. However, we have not been discouraged, but have set about the aerial defence of London along somewhat novel lines and with a great measure of success. London has within the last week or so been visited repeatedly by at least 20 machines per night, yet only one or two machines have, as a rule, succeeded in penetrating our defences. These defences will continue to develop, and the public may rest assured that nothing will be left undone which may tend to the more complete protection of this nerve centre of the Empire, as well as other places likely to be visited by enemy machines. Naturally you will not expect me to give particulars, nor can I definitely promise a certainty of success where the whole field of operations is so very novel. But no effort will be spared to protect the people against these outrages. The Government appreciate to the full the calmness and heroism displayed by the vast bulk of the population under the most trying experiences. It is no use minimising the danger and alarm caused by these raids, but at the same time it is the worst policy possible to exaggerate them.

"The Germans receive the most exaggerated and distorted accounts of the demoralising effects and the material damage caused by these raids. I have seen in the German papers accounts by so-called neutral eye-witnesses who give the most awful and astounding reports of these raids. The London population is painted as in a state of ungovernable panic, and many of the great banking and business places are reported to have been destroyed. You know the material damage of these raids has been absolutely negligible, and as for the loss of life many times more people are killed and injured in 'bus accidents than in these air raids. I have been in every raid since last July, and nothing has struck me more than the calmness of the population as a whole. Indeed, I think there is a little too much light-heartedness, and that it would be wise and patriotic for every citizen to follow the sound advice given by the police as to behaviour during air raids. Nothing can be wider of the mark than the distortions and exaggerations which reach the German people and buoy them up with the false hope that these raids are steadily undermining our national *moral*, and that London has the jumps and is being converted into a heap of ruins. All will be well if all will do their duty. From the Government you are entitled to expect that no effort will be spared to protect the civilian population; the Government again are entitled to expect from you the observance of all necessary steps to avoid casualties, and, above all, that steadiness of spirit which is the one assured foundation of our coming victory.

"Our air policy has been entirely different from that of the enemy. It has been our main and constant object to obtain and maintain military predominance in the air on our various fronts and to bomb only military objectives such as railways and railway stations and aerodromes, junctions, docks, depôts and military and naval bases of all

sorts. Since July 31st we have been fighting a great battle in Flanders which has meant a great and simultaneous struggle in the air. In the Battle of the Somme we mastered the enemy completely in the air. Taught by this he has made great efforts to prevent us doing this again, and has concentrated a great many aeroplanes against us from other fronts. We started bombing with heavier-than-air machines. The enemy has followed us, but has not caught us up. He bombs the French towns and the troops behind the lines, and does far more damage there and inflicts far heavier loss than we have suffered in England, but, again, we bomb him much more, and cause him far greater loss behind his lines.

"Last month our Naval and Military aeroplanes dropped 207 tons of bombs behind the enemy's lines. In the same period he dropped 4½ tons of bombs on London. In that month we bombed him on 23 days and 19 nights, chiefly attacking his aerodromes, and in particular the great aerodromes at St. Denis Westrem and Gontrode, where the Gothas live, setting hangars and sheds on fire, and, as figures prove, damaging his machines and pitting his aerodromes with shell holes; we also bombed his billets, trains, transports and railway stations, causing him very heavy losses.

"In London during last month our total air losses were 51 killed and 247 injured. During the first nine months of this year the losses from air raids were 191 killed and 749 wounded, as against 487 persons killed and 14,104 injured in traffic accidents in the Metropolitan police area.

"Hitherto we have, as far as possible avoided using the aeroplane as an engine of destruction and terrorism against the civilian population of the enemy countries. The enemy, on the contrary, has from the very beginning devoted his aircraft to all kinds of non-military uses. First with the Zeppelin, and now with the aeroplanes, he is conducting a campaign of ruthless, pitiless terrorism against undefended towns and populous centres, which have no direct military value. Indeed, one cannot but come to the conclusion that the Germans in their raids are avoiding objectives of direct military value. There is really no indication that they are trying to strike buildings or works of real military importance. Invariably they attack the residential quarters of London, not its outside arsenals or fortifications or even its docks, still less places of direct military importance, except very occasionally, and as it were by mistake. I imagine their object in all this calculated brutality has been two-fold: first, to strike terror into the hearts of the civilian population and to destroy their *moral* by every means, however abominable; secondly, to force us to take machines back from the front for the defence of London and other home areas. In both objects they have miserably failed. There is not in London or England a single machine taken back from the front for home defence; and the national temper, instead of weakening, is, on the contrary, hardening under the strain of these terrors and abominations. If the German understood the psychology of this people he would have no doubt about the results. Cowards become more cowardly under the threat of danger, but brave men and women only become more determined, and the people of London are now, after these raids, thinking less of peace than ever before. But the Germans never understood the psychology of their enemies, and so they will continue to blunder to the end of the chapter. Meanwhile, a very bitter temper is growing up in this country, a temper with which any Government will have to reckon seriously in settling its future air policy. And I am sure it is not the people of this country which will be to blame for any further intensification of the horrors of war.

"It is wrong to think that we have hitherto had no means at all of carrying our aerial warfare into the enemy country. I have already said that ever since the Battle of the Somme we have had clear military superiority in the air, and on a small scale we could have followed that up by bombing enemy centres as they have bombed London and other places in this country. But we felt we should prepare for an air offensive on a large scale, and we were anxious to avoid adding further horrors to this war, already the most cruel in the history of the world. But we are dealing with an enemy whose *kultur* has not carried him beyond the rudiments of the Mosaic Law, and to whom you can only apply the maxim of 'an eye for an eye and a tooth for a tooth.' On that principle we are now most reluctantly forced to apply to him the bombing policy which he has applied to us, and I am afraid we have no longer any choice in the matter. Allow me to emphasise two points which I hope will be borne in mind when it is ultimately found that



my words are not bluff but serious and far-reaching in their import. Firstly, we did not begin this business of bombing industrial and populous centres; the enemy began the practice, just as he began the use of poison gas and many other contraventions of international law, and we have been most reluctantly forced to follow suit after a long delay which has severely tried the patience of the British people. Secondly, I look upon these developments of the art of war as utterly bad and immoral, and while I do not fear them, if, as in the present case, they are forced on us, yet I should infinitely prefer that both sides should desist from such cruel practices. We shall do our best to avoid the German abominations, and in our air offensive against the military and industrial centres of the enemy we shall use every endeavour to spare, as far as is humanly possible, the innocent and the defenceless, who have always in the past enjoyed the protection of international law. But it is inevitable that in any extended aerial offensive into the

enemy territory into which we have now been forced they should to some extent also suffer, and I can only express my deepest regret that these developments should have been forced on us. This war has already been cruel and horrible beyond any in the known history of mankind, and its sorrows and anguish are slowly breaking the heart of humanity. It is almost unbearable to think that another chapter of horrors must be added to the awful story. But we can only plead that it has not been our doing, and that the blame must rest on an enemy who apparently recognises no laws, human or divine, who knows no pity or restraint, who sang 'Te Deums' over the sinking of the 'Lusitania,' and to whom the maiming and slaughter of innocent and helpless women and children appears a legitimate means of warfare. In the face of such abominations it is not for us to meekly fold our hands. We can only fight to the uttermost for the ideals of a humaner civilisation, which we trust and feel convinced will triumph in the end."

## R.N.A.S. V. GOTHAS AND SUBMARINES.

THE following details of successful encounters between R.N.A.S. and Gothas and submarines are taken from records at the Admiralty:—

"The report of a Squadron Commander of the R.N.A.S. after a recent hostile air raid, shows the odds which British pilots cheerfully accept in beating off the raiders. The officer in question had been flying continuously under war conditions in France, bombing and fighting, for upwards of 18 months.

"When at 11,000 ft., runs his report, 'I saw ten Gothas coming inland. I climbed up to them, and engaged one on the right of the formation about three miles out to sea at something over 12,000 ft. Fired 100 rounds from straight behind his tail at 100 yards' range. Bullets were seen to enter the Gotha's fuselage. Machine started into a slow spin. I followed and fired about 25 more into him to make sure. My gun then jammed, and in trying to clear I got into a very fast spin with my engines on. Got out of this just in time to see the enemy crash into the sea. I then landed, had my gun jamb cleared, and went up after the remaining eight Gothas—one had been shot down in flames—and caught up with them at 14,000 ft., and engaged them in turn from both above and below. Then devoted all my attention to one Gotha, and after firing 200 rounds into him silenced both his guns. I think both German gunners must have been hit, as I was able to get within 60 ft. of him without being fired at. I finally ran out of ammunition.' The story ends with his ammunition.

"Two British seaplanes on submarine patrol above the North Sea sighted a submarine on the surface travelling at about 14 knots. Two men were observed on the conning tower. Like a pair of hunting kestrels, the seaplanes swooped

down to a height of 800 ft., and the leading machine dropped a bomb, which burst on the starboard side of the submarine halfway between the stern and conning tower. The submarine heeled slowly over to port and remained in that position. The bow rose into the air as she stopped and began to sink. The second seaplane then dropped her bomb, which burst in front of the conning tower, and as the submarine sank another bomb was dropped by the first machine, which had wheeled round and passed over the spot 15 seconds later. Having disposed of their quarry, the two then circled round for a quarter of an hour searching for possible survivors. None were seen, however, and they accordingly returned to make their report.

"On another occasion a seaplane on patrol overheard a hostile wireless signal, apparently in close proximity; shortly afterwards a large submarine was sighted lying on the surface a mile ahead. Flying at 80 miles an hour, the seaplane whizzed over the enemy, and released a bomb. The submarine simultaneously fired a round with his foremost gun, the shell bursting 50 ft. in front of the seaplane. As the latter turned, the bomb which he had dropped exploded, tearing a great rent in the hull of the submarine. Flashes of flame were then seen spurting from the water ahead, and through the mist three more hostile submarines were sighted in line abreast, reinforced by three hostile destroyers and two seaplanes. All were firing at the British seaplane, which, however, turned and again flew over the sinking submarine. A second bomb was dropped, and the submarine sank, leaving a large quantity of oil, air-bubbles and wreckage floating on the surface. Her bombs exhausted, the seaplane returned, having first photographed the sinking submarine and its would-be avengers."

### The Question of Reprisals.

At a meeting called by the National Imperial Association, "in support of an increased air service," held at the Central Hall, Westminster, on October 3rd, Mr. W. Joynson Hicks moved the following resolution:—"That this meeting of the citizens of London requests the Government to take the necessary steps to provide—(1) Unification of the Air Services under one responsible head; (2) adequate defence of this country against air raids; (3) sufficient machines for the needs of the front, the defence of this country, and a great air offensive."

Mr. Joynson Hicks said:—

"What the Germans had done we could do. Our men were better than their's, and our engineers were as good as their's. The Gotha machine was only a copy of one of our's. But we had not yet heard the last of aeroplane progress. Three years ago we had about 50 machines; they could fly at 60 or 65 miles an hour and could climb 5,000 feet in half an hour. Now we had machines which could fly 150 miles an hour, climb 20,000 feet, and carry considerable loads of bombs. I tell you," added Mr. Joynson Hicks, "that before another year is out it will not be 150, but 250, miles an hour. To-day the only limit to the height at which our fighting takes place on the Continent and the height at which raiders can come here is the human limit imposed by the difficulty of breathing. To-day our men and theirs go up 22,000 feet. In another year's time, by scientific means which are now being actually used, they will be able to go considerably higher still, out of reach of any anti-aircraft gun you have at the present time. The Government knows these things. The Army knows them. The Air Service knows them. Why are we not

prepared? During the last week in London the official casualties have been 52 killed and 257 injured.

Later, while Mr. Joynson Hicks was speaking, a note was handed to him. On reading it to the meeting it proved to be the announcement that the Government had decided to undertake reprisals.

Sir Henry Cowan said "the statement that reprisals would be undertaken was very opportune. He declared that all war was a reprisal. We must rain death and devastation on the German cities within our reach, of which there were a dozen of first-class importance."

Mr. Havelock Wilson said "that neither Mr. Asquith nor Mr. Lloyd George was the person to be attacked. They were responsible for the Government, but they did not 'do the job.' The men really to blame were the permanent officials whom the public never saw or heard of. In January, 1915, the smartest machine was the Fokker, which could do from 90 to 100 miles an hour. An American arrived here with a machine that would do 120. The Admiralty took the machine up and built a factory to make it. That Factory cost £100,000. Up to date it had turned out six machines. The Admiralty would not part with the report of what the machine could do to the War Office. He challenged the Admiralty to give an explanation. He hoped the announcement made that night meant that we were going to make things as hot for the Germans as we possibly could. So far as he was concerned, it was war to the knife. The sailors had already against the Germans a boycott for more than two years after the war, and for every crime the Germans committed on land or sea they would add a month to the duration of the boycott."

The resolution was carried unanimously.



# **AIRISMS** **FROM THE FOUR Winds.**

If the request of General Sir Francis Lloyd, as Controller of the Defence of London, is acted upon by the Bishop of London, to throw open the churches in the London District, for admission of those who may wish to take shelter during air-raids, we doubt whether the protection will be as reliable as at first glance it might appear. Those churches which have a crypt are quite good for the purpose, but probably the majority have no sanctuary of safety of this nature. Therefore, should the sacred buildings be crowded with citizens up to the number of 2,000 or more each, the effects of a bomb through the roof might truly result in a disaster worse than any so far recorded. Each family in their individual basements or lower floor would be a far safer spreading of risks, and except for those who can only rely on the particular form of refuge suggested by Sir Francis, we would strongly counsel members of the public rather to ear-mark the lowest point of some modern-built four or five storey house, within easy reach of their own residence, as a protective cover against the Huns' bombs and our own spent shrapnel. There are churches in and about London, which would be absolutely worthless as safety shelters, and it would be a mistake if, by inviting general access to these as an antidote for raid dangers, a false security were encouraged, when a little forethought might avoid all fear of a serious holocaust.

WHATEVER the psychological effect may ultimately be upon the German nation, of a continuous series of bombing attacks on their towns, it is pretty evident in the anticipation of our replying in kind to the raid courtesies extended by the Hun airmen to London, the opening of our air campaign is looked upon with anything but calmness by those German cities which may consider themselves within the danger zone of our raiding squadrons. It remains to be seen whether the effect will be an appeal to humanity squeal, as most have predicted, or a demand for redoubled air attacks against English towns by way of reply. Cologne, which is particularly upset at the prospect, may have the opportunity of leading the way in the choice of alternatives.

"KULTUR" as made in Hunland is assuredly quite capable of the latest infamy reported from Amsterdam. The suggestion is that the Germans are themselves bombing Belgian towns in order to create hostile feelings against the Entente,

amongst the Belgian population still left. There is every probability of its being a true bill, as the vehement assertion of innocence by the German authorities, followed by heavy fines against towns where the report has been spread, coupled with threats of the death penalty against individuals for the same offence, gives colour to the old adage that excess of protestation carries with it its own conviction.

THE month's hard labour meted out to a spreader of false reports of impending air raids in the City last Saturday was none too severe. Next time it might be made six months, without the option, just to encourage the next idiot to see what his portion would rise to. We would suggest the mildest sentence for this sort of pastime might be "for the duration," to ensure no possibility of a repetition.

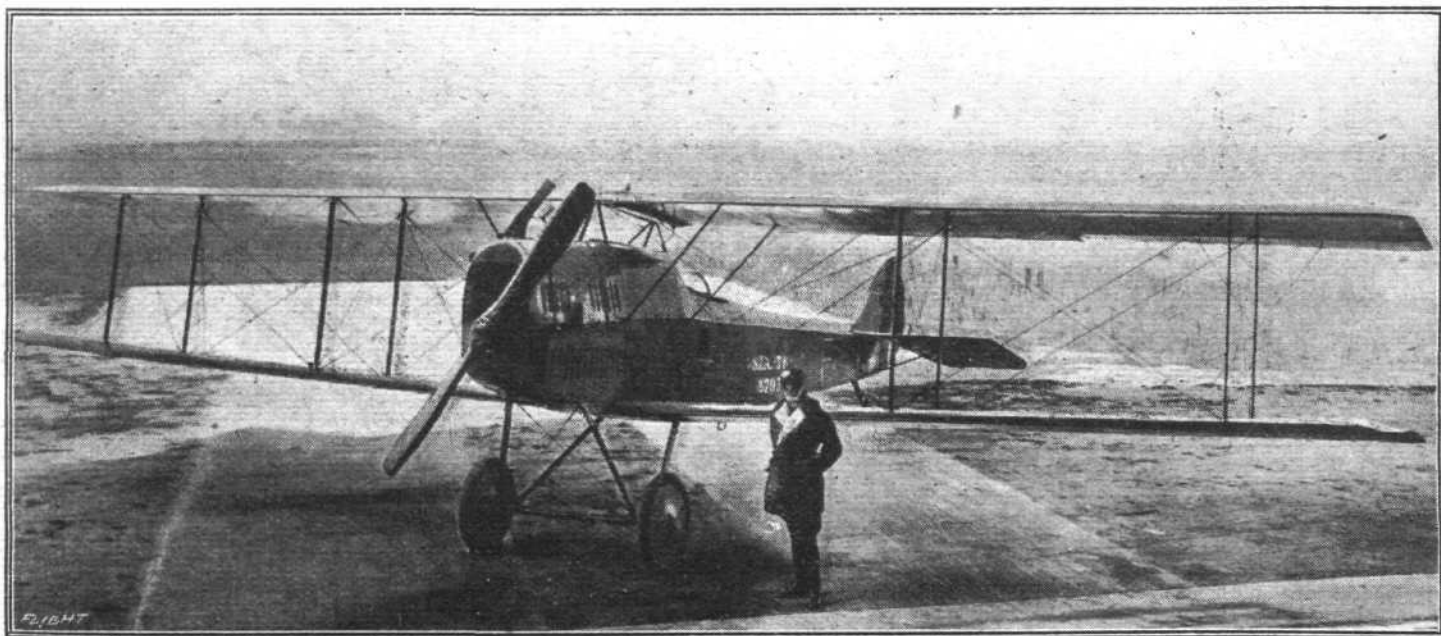
Is it just Hun swank that allows them to supply a dozen large aeroplanes for the Dutch Army, as reported last week from Amsterdam? One would have thought they wanted all they could turn out on the Western front. Perhaps it is pilots that are lacking.

IN all probability the coming home to roost of Hun "frightfulness" will be found in the repudiation presently, when peace breaks out, by the German Government of its war loans indebtedness, capital and interest.

AN interesting "exhibit" for the War Museum should be the German briar pipe reported to have been found last week in the garden of a house in an Essex town, after the Gotha raiders had passed on the Sunday.

A portion of the stem has been cut and flattened, and upon it is written in indelible ink, "Karl Werner, 13138—A.G." The under side of the bowl and the stem have been notched eleven times and on the side of the mouthpiece are more notches.

The finder of the pipe states: "There was no smell of tobacco about the pipe, and it had not apparently been recently smoked. It is possible that it was used by the owner as a dry pipe, as the mouthpiece shows signs of hard biting. The notches cut in the stem may record the number of times the airman had flown with it in his mouth. 'Smoking' a dry pipe is not unusual."



Capt. the Marquis Laureati, standing beside the S.I.A. biplane on which he made his non-stop flight of 1,000 miles from Turin to Naples and back. On the Turin-Naples trip Capt. Laureati flew alone, but on his flight from Turin to London he carried a mechanic. The S.I.A. Company, the builders of the machine, is a subsidiary of the Fiat Co. of Turin.

It is about time our "Specials" had steel helmets passed out to them for raid wear. Judging by some of the chunks of shrapnel which have come our way, the Specials who are so busy warning others to "take cover" are assuredly entitled to this official consideration. The E. Division is the first to receive the distinction, and it is to be hoped the entire force will not be long before it has similar protection.

FOR the direction of aeroplane production in the United States, an Aircraft Board Bill has been brought into being by President Wilson, providing an Army and Navy commission of officers and civilians.

A COUPLE from the last raid:—

From a boy's point of view:—The guns had hardly commenced firing when two boys standing near a doorway were heard to remark, as the shrapnel splinters rattled in the road: "What a bit of luck. Now we're certain to get a bit."

Not the Government Brand:—The conductress of a tramcar becoming faint, a man ran into his house near by to get some brandy, and on his return she partook of the contents of the bottle, afterwards remarking: "That's funny-tasting brandy, but I feel better." After the tram had proceeded on its journey the man discovered to his astonishment that he had brought from his house a wrong bottle, containing "quinine and iron," his sister's tonic.

AND a raid trio:—

Hymn for Huns:—While an air raid was at its height the juvenile members of a London family were heard singing, "All good things around us are sent from Heaven above."

Statistics:—"It took two men 22 hours to chisel a 12-in. hole through the 3-ft. flint-concrete roof of the London Opera House," says an announcement outside that building, as an evidence of its bombproof nature.

His name is Washington:—George Washington's explanation was accepted to-day at the Guildhall when he was summoned for failing to shade lights on the night of an air-raid. In the excitement, he said, he took cover in a tube and forgot one light in his office.

IN our issue for September 6th reference was made to a round robin which had been issued by a retired Dutch Major-General, for subscriptions wherewith to present to Sergt. Lok some souvenir of his bringing down at Beerta in the Groningen province on August 18th a Hun aeroplane which had violated Dutch neutrality. That the *kwartje* (5d.) asked for from 600 sympathisers was more than promptly forthcoming is now made clear in the announcement that the testimonial has been duly presented, consisting of a gold watch and chain and £54 subscribed for by 1,225 persons.

THAT the American nation is working for a record hustle over their new war policy there is daily growing evidence. Some of the efforts being put forth fairly take away one's breath. What the effect will be upon some of our fossil administrators it is beyond the reason of the ordinary man to grasp. Driving them into lunacy is about the most probable result. Take by way of instance the latest announcement of Mr. Baker, the Secretary for War, in regard to a new aeroplane motor which he states has been perfected the other side for equipping the stupendous aeroplane fleet which our new Allies have under construction. This is how Mr. Baker describes the coming into being of this new motor:—

"Two of the best engineers in the country, who had never before seen each other, were brought together at Washington, and the problem of producing an all-American engine at the earliest possible moment was presented to them. Their first conference, on June 3rd, lasted from the afternoon until 2.30 o'clock in the morning. They were charged with the development of an aeroplane motor for American airmen over the battlefields of Europe.

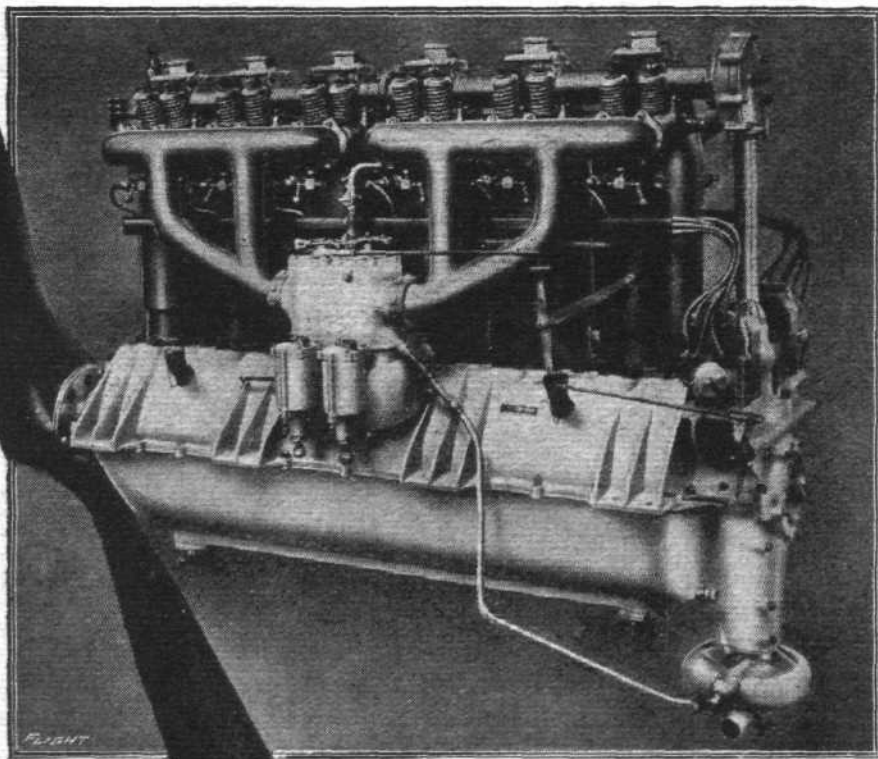
"For five days neither of the men left the suite of rooms engaged for them. Consulting engineers and draughtsmen were brought to Washington to assist them. Work in the drafting room went on continuously day and night. Each of the two engineers in immediate charge alternately worked a 24-hour shift. The engine was promised before July 4th; and on July 3rd, 28 days after the drawings were started, it was set up."

WITHOUT doubt, some hustle!

It has been decided that the erection in France of the monument to Wilbur Wright decided upon before the war is not to be delayed because of present hostilities. The work is to be proceeded with, and it is hoped that arrangements will shortly be made for the monument to be erected at Le Mans, the spot associated so intimately with Wilbur Wright's first flights in France.

PROFESSOR G. H. BRYAN, F.R.S., of the University College of North Wales, who is so interested in helping forward the future of aviation, has secured from the Industrial Research Committee of the Board of Education, a grant which will enable him to devote the whole of next session to the carrying on of a piece of aeroplane research of national importance. In the first instance, Professor Bryan proposes to carry out the work at the University of Bristol.

THE series of photographs taken by the R.F.C., which in the main have already been seen in London, now on view as a leading feature of the Royal Photographic Society's Exhibition in Russell Square, is quite a study for those who are interested in photography from above. Indeed there is material to study for anyone with a sense of appreciation of the unique. What our aircraft means to our fighting staffs can in a small way be realised from these pictures, including



The 300 h.p. Fiat engine fitted to Capt. the Marquis Laureati's S.I.A. biplane. It is fitted under a bonnet and behind a radiator, and, in fact, the fore portion of the fuselage resembles a motor car body. The engine is a standard type Fiat, with six separate steel cylinders having welded on sheet-steel water jackets, and four inclined valves in the head, operated by a single overhead camshaft. A twin carburettor is employed, and there are two magnetos firing a pair of plugs in each cylinder. The propeller is mounted direct on the crankshaft, and runs at a speed of 1,200 revolutions a minute.



as they do aerial photos. of a barrage, of the effects of a bombardment, of reconnaissance machines at work, of German machines, &c., &c. Should these not prove sufficiently absorbing to the casual visitor, it is easy to spend an hour or more in the examination of the exquisite art studies, which always form such an attractive feature of the Society's show.

IN response to an appeal on behalf of the Royal Flying Corps Hospital, the nice little sum of £3,826 has been contributed by the Johannesburg branch of the Overseas Club.

LORD NORTHCLIFFE, who has now been in America in charge of the British Mission for six months, is likely to be back home before overlong. He has done most invaluable work for the Empire and the world at large during his stay, and it is hardly surprising that he feels it getting time for him to turn his attention for a time to affairs at home, not forgetting aviation, present and future.

BRIGHTON will have to look to its laurels, as it is now suggested, *à propos* of the recent visit to the Stock Exchange of Captain Laureati, who flew, non-stop, from Turin to London, that by October, 2017, quite a number of the men

in the "House" will have "air seasons" between Italy and London, travelling backwards and forwards night and morning, as is now their custom to the Queen of Watering-places.

THAT an Air Ministry, with enlarged powers and independent control will before very long be an accomplished fact, may be accepted as a necessity of the situation. Necessarily Parliamentary procedure demands the sanction of the House, but this will hardly be difficult to secure in the present temper of the country. Many of the statements and deductions, however, in connection with matters now in the melting pot, the bandying about of names, &c., must be taken with considerable caution, although Lord Cowdray, the present Chairman of the Air Board, will no doubt be glad to be relieved of his responsibilities, when the time comes for the re-shuffle.

ANOTHER question to be decided by Parliament when it resumes work is as to the hours for its labours. There are quite a number of members who would regard it as quite a national calamity should one of the Huns' hefty bombs distribute its contents whilst the House was assembled. And there are others.

## ANSWERS TO CORRESPONDENTS

**H. S. (Hastings).**—Judging from your description, the machine is probably one of the R.E. type biplanes.

**T. E. R. (Manchester).**—Applicants for commissions in the R.N.A.S. "must be in good health and free from any physical defect of body, impediment of speech, defect of vision or hearing, and also from any predisposition to constitutional or hereditary disease or weakness of any kind, and be in all respects well developed and a good athlete."

**H. M. (South Shields).**—There is no book dealing with "construction," but if you mean design we should recommend "Aeroplane Design," by F. S. Barnwell, which can be obtained from "FLIGHT" Offices for 2s. 10d. post free.

**D. R. K. (Rugby).**—Theoretically there is nothing inherent to the aeroplane which prevents the adoption of automatically controlled *ailerons*. A number of devices have been designed for the purpose, many of which, however, suffered from this common fault, however much they may have differed in principle, that there was an appreciable time lag. The majority of pilots are, we think, against the idea of any mechanical control device, and one condition in particular should always be fulfilled, namely, that in an emergency the device should be capable of being instantly put out of gear so as to let the pilot take direct control when desired. Apart from the prejudice of pilots, the objection to any device for automatically controlling the aeroplane is that no matter how simple the device, it always means a certain amount of mechanism, or, in other words, an additional chance of something going wrong. For the large machines of the future, however, it is practically certain that some form of controlling mechanism will be employed so as to relieve the pilot of all the control with the exception of steering his compass course. If you are interested in the subject we should advise you to obtain a copy of "FLIGHT" for January 29th, 1915, in which was described the highly ingenious and very success-

ful "Sperry Automatic Pilot," which is one of the best automatic stabilisers ever produced.

**"Icarus" (Oldham).**—On an absolutely calm day it is quite possible for a pilot to switch off his engine, set his elevators, and descend in a straight glide without interfering with his controls. If the machine is longitudinally stable the dive may probably commence with a few "swoops," which will, however, gradually damp themselves out, after which the machine picks up her proper gliding angle and continues without oscillating. The greater the amount of stability the greater the pitching, hence designers usually so design their machines that there is a sufficient, but not an excessive amount of longitudinal stability. The time taken to come down from 10,000 ft. will depend on various considerations. We take it that what you have in mind is the time taken with the flattest glide possible. It should be pointed out that an aeroplane can be made to descend at almost any angle, and that when the gliding angle is referred to, the smallest angle of which the machine is capable is always meant. Let us suppose that the machine in question has a gliding angle of one in 10, and glides at a speed of 150 ft. per second. In each second it therefore drops 15 ft., so that the glide from 10,000 ft. would take 11.6 minutes.

**D. J. S. (Petersfield).**—The question of stability is already solved in all modern machines to quite a sufficient extent for all practical purposes, and certainly such an elaborate scheme as that of your suggested tetrahedral cell arrangement would never have any chance of being adopted owing to the enormous head resistance offered by the cells. The extra lift—granting that there would be any at all, which does not seem certain—would never be sufficient to outweigh the disadvantages of the great head resistance. We should advise you to drop the matter entirely, as we cannot see any hope of making any progress along the lines you suggest.

### British Agent on Pacific Coast.

It was announced in New York on October 9th that Mr. Arthur F. Thane had been appointed Purchasing Agent, for Great Britain on the Pacific Coast, of lumber for aeronautical supplies.

Mr. Thane will also have charge of the shipping on the Pacific Coast in the interests of Great Britain.

### Aliens and State Work.

AN Order from the Home Secretary relating to the employment of aliens appeared in the *London Gazette* of Oct. 9th. The effect of the Order is that after Oct. 15th no alien shall undertake or perform work of the following descriptions, unless he has in his possession an identity book:

Any work (other than munitions work as defined in the Aliens Restriction Order) for, or on behalf of, or under contract with the Admiralty, Army Council, or Air Board, at any naval, military, or aeronautical camp, barracks, aerodrome, office, or other naval or military establishment.

Other work which an alien is debarred from, is for, or on behalf of, any telegraph, telephone or railway or other concern engaged in the transmission of messages or members of His Majesty's forces, naval or military hospital or medical organisation or transport or work in connection with canteens or social clubs or organisations of a benevolent or religious nature for the benefit of or in contact with members of His Majesty's forces.



# The British Air Services



"PER ARDUA AD ASTRA"

UNDER this heading are published each week the official announcements of appointments and promotions affecting the Royal Naval Air Service and the Royal Flying Corps (Military Wing) and Central Flying School. These notices are not duplicated. By way of instance, when an appointment to the Royal Naval Air Service is announced by the Admiralty it is published forthwith, but subsequently, when it appears in the LONDON GAZETTE, it is not repeated in this column.

## Royal Naval Air Service.

Admiralty, October 4th.

E. L. Taylor granted a temporary commission as Lieut., R.N.V.R., with seniority October 3rd.  
P. H. Clifford and P. E. Gwyer granted temporary commissions as Sub-Lieuts., R.N.V.R., with seniority October 3rd and August 19th respectively.  
Prob. Flight Officer W. Catchpole promoted to Flight Sub-Lieut., with seniority August 19th.  
Temp. Prob. Flight Officers.—T. D. Manning and E. H. F. Scott promoted to Temp. Flight Sub-Lieut., with seniority August 19th and July 19th respectively.

Admiralty, October 5th.

Prob. Flight Officers J. Ellingham and H. G. Owen, both transfd. to Prob. Ob. Officers, seniority respectively June 10th and July 1st.  
2nd Writer L. T. Kerry, entered as Prob. Flight Officer for permanent service, seniority October 2nd.

H. Batsford entered as Lieut., R.N.V.R. (Temp.), seniority Sept. 28th.

G. V. Deakin entered as Sub-Lieut., R.N.V.R. (Temp.), seniority Sept. 20th.

Admiralty, October 6th.

Prob. Flight Officer (Temp.) B. H. Sisson, promoted to Flight Sub-Lieut. (Temp.), seniority Sept. 10th; and to Flight Lieut. (Temp.), Oct. 4th.  
C.P.O. (3) T. C. Tyers, T. J. E. Thornton, and G. Coles, all promoted to Act. Wt. Officers (2nd grade), seniority Sept. 21st.  
P.O. F. L. Kingham, J. F. Stevens, and W. G. Jones, all to Act. Wt. Officers (2nd grade), seniority Sept. 21st.

The following have been entered as Prob. Flight Officers (Temp.), seniority Sept. 30th.—J. S. Fergie, J. W. McVean, and J. W. Kennedy.

A. J. Price entered as Prob. Ob. Officer (Temp.), seniority Oct. 5th.  
The following temp. entries (R.N.V.R.) have been made:—Lieut.: F. Rooks, seniority Oct. 4th. Sub-Lieuts.: H. Churchman and B. Walker, seniority Oct. 2nd and 6th.

A.M. (II.) J. A. C. Sumner, granted temp. commission as Lieut. (R.N.V.R.), seniority Oct. 5th.

## Royal Flying Corps (Military Wing).

London Gazette Supplement, September 2nd.

Staff Lieutenant.—Temp. Lieut. J. E. B. Thornely, Gen. List, from a Flying Officer; Aug. 31st.

The following appointments are made:—

Flight Commanders.—From Flying Officers:—Lieut. P. V. Tanner, S.R., and to be Temp. Capt. whilst so employed; July 18th. Major E. G. Joy, Canadian Local Forces; Temp. Capt. H. R. Coningsby, Midd'x R.; Capt. G. E. Chadwick, M.C., E. Lan. R.; and to be Temp. Capt. whilst so employed: Temp. Lieut. H. E. Scoones, Gen. List; Temp. Lieut. W. M. Fry, M.C., Gen. List; Temp. Lieut. C. H. B. Readman, Gen. List; Lieut. L. V. Hirst, S.R.; Lieut. C. Faber, S.R.; Sept. 1st. Temp. 2nd Lieut. A. J. P. Hytch, Gen. List; Sept. 17th. 2nd Lieut. (Temp. Lieut.) C. Eales, Devon R. (T.F.); Temp. 2nd Lieut. W. R. Fish, Gen. List; Sept. 18th.

Flying Officers.—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—T. L. Atkinson; July 8th. E. B. Garnett; July 13th. H. A. Smeeton; July 14th. P. A. O'Brien, C. C. Robinson; July 27th. J. H. H. Underwood; Sept. 8th. 2nd Lieut. H. W. Padgett, R. Lanc. R. (T.F.), and to be confirmed in their rank; Sept. 9th. Temp. Lieut. E. G. S. Gordon, Gen. List, from a Flying Officer (Ob.), with seniority from Aug. 12th, 1916; Lieut. C. F. Keller, Lond. R. (T.F.), and to be confirmed in their rank; Sept. 10th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—L. C. R. Alexander, A. J. Maitland, H. F. Faulkner, A. J. Moore, F. P. Magoun; Sept. 11th. 2nd Lieut. H. T. Matthews, Yeo. (T.F.), and to be confirmed in their rank; Sept. 12th. (on prob.) J. B. McIntyre, Gen. List, and to be confirmed in their rank; Lieut. J. L. B. H. Cordes, Glouc. R., S.R.; Lieut. R. I. V. Hill, Welsh R. (T.F.), and to be confirmed in their rank; Temp. 2nd Lieut. A. L. Walker, R. Fus., and to be confirmed in their rank; Sept. 12th.

Flying Officers (Observers).—Temp. 2nd Lieut. F. F. Bramwell, Gen. List (June 6th), with seniority from Feb. 15th; 2nd Lieut. A. T. Smith, Sea. Highrs. (T.F.), with seniority from June 26th, and to be confirmed in their rank; Temp. 2nd Lieut. L. H. Watkinson, Wilts. R., with seniority from June 27th; 2nd Lieut. P. V. Burton, Bedf. R., S.R., with seniority from June 27th, and to be confirmed in their rank; Lieut. L. G. Kettlewell, R. Dub. Fus., S.R., with seniority from Aug. 7th and to be confirmed in their rank; Temp. 2nd Lieut. (on prob.) R. S. Gilbert, Gen. List, with seniority from Aug. 7th, and to be confirmed in their rank; Lieut. H. D'A. McGrath, Canadian Pioneers, with seniority from Aug. 14th; Sept. 14th.

Assistant Instructor in Gunnery (graded as Equipment Officer, 3rd Class).—Temp. 2nd Lieut. F. M. M. Ellis, Gen. List, from a Flying Officer; Sept. 13th.  
Balloon Officer.—Lieut. A. B. Harper, R.F.A. (T.F.), and to be confirmed in their rank; July 1st.

Park Commander.—Temp. Capt. L. Y. K. Murray, Gen. List, from an Equipment Officer, 1st Class, and to be Temp. Major whilst so employed; Aug. 31st.

Equipment Officers, 3rd Class.—Temp. 2nd Lieut. H. B. Lee, R.E.; Jan. 26th. 2nd Lieut. E. Meynell, Gen. List; July 22nd. Temp. Lieut. L. Miller, Gen. List, from a Flying Officer (Ob.); Sept. 11th. Temp. 2nd Lieut. S. N. Veitch, Gen. List, from a Balloon Officer; Sept. 12th.

Schools of Instruction.

Assistant Instructor in Gunnery (graded as an Equipment Officer, 3rd Class).—The appointment of Capt. A. M. Lester, Lond. R. (T.F.), notified in the Gazette of Sept. 1st is cancelled.

General List.—2nd Lieuts. (T.F.), to be Temp. Lieuts.:—A. Mann, A.S.C.; K. Jamieson, Yeo.; F. A. V. Cook, Durh. L.I.; E. Y. Fitzgerald, Yeo.; A. Newman, M.C., Essex R.; A. J. J. O'Farrell, E. Lan. R.; R. C. Taylor, R. War. R.; N. Macgregor, Arg. and Suth'd Highrs.; G. J. Ogg, High. L.I.; D. C. Bell, Midd'x R.; L. L. Falck, Midd'x R.; A. E. L. Skinner, Yeo.; F. J. Tanner, Yeo.; W. W. Fielding, Yeo.; F. Chisnall, W. Rid. R.; W. H. Howell, Essex R.; S. Chadwick, Durh. L.I.; J. S. Bolton, Durh. L.I.; F. A. Gill, North'n R.; F. O. Rose, Essex R.; J. W. Antcliffe, Lan. Fus.; G. H. Harrison, Midd'x R.; A. H. G. Dunkerley, Arg. and Suth'd Highrs.; W. S. Cattell, North'n R.; D. H. King, Midd'x R.; J. S. Ralston, M.C., Sco. Rif.; F. H. Berry, R. Scots; J. D. Gilbert, Yeo.; G. P. Wakeman, Yeo.; J. R. Milne, Ches. R.; N. A. Hardie, High. L.I.; G. T. Shuttleworth, Midd'x R.; F. V. Durkin, Worc. R.; C. O. Rusden, Midd'x R.; A. C. Dent, Yeo.; E. D. Tyack, R.E.; E. S. Livock, R. W. Surr. R.; A. S. A. Herne, Midd'x R.; C. Donald, Gord. Highrs.; W. J. Keene, Lond. R.; R. H. Lemon, R.W. Surr. R.; J. A. Boret, R.W. Surr. R.; A. J. Homersham, Lond. R.; C. S. Ramsay, R.E.; A. J. Warwick, Glouc. R.; J. Tennant, M.C., Cam'n Highrs.; F. Baxter, R.E.; F. M. Corry, Notts. and Derby R.; P. D. Montague, Rif. Brig.; I. Morgan, R.F.A.; W. L. Yorath,

L'pool R.; C. E. O. Cowell, E. Lan. R.; F. W. Burdick, Army Cyclist Corps; H. I. Turner, R.F.A.; I. Gregory, R.F.A.; E. Blythe, L'pool R.; H. M. Whitcut, S. Staff. R.; C. W. Pearson, North'd Fus.; J. Hyslop, K.O.S.B.; H. S. P. Walmsley, N. Lan. R.; C. R. Gaffney, L'pool R.; H. H. Shorter, Durh. L.I.; P. Burrows, Essex R.; C. R. Sands, Notts and Derby R.; Sept. 1st. Temp. 2nd Lieuts. (on prob.) are confirmed in their rank:—G. F. Campbell, G. Maddock, L. L. Brown, K. R. Napier, C. J. Baylis, A. Matthews, T. W. George, E. D. Inskip, W. K. Crewe, H. A. Dyer, L. J. Anstey, A. Jackson, N. McLeod, J. Machaffie, G. R. C. Oliver, L. O. Spain, C. P. Vivian, A. E. Franklin, A. G. Bullock, E. J. Phelps, E. C. Ponking, W. D. Buchanan; to be Temp. 2nd Lieuts. (on prob.):—T. H. Maltby, W. M. F. Sherwood, N. H. Jenkinson; Sept. 21st.

Supplementary to Regular Corps.—Lieuts. (Temp. Majors) to be Capt.:—S. A. Currin, G. P. Grenfell; April 1st. 2nd Lieut. (Temp. Major) T. G. Clarson to be Lieut.; Sept. 1st. 2nd Lieut. C. R. Kempson resigns his commission; Oct. 3rd.

London Gazette Supplement, October 3rd.

Military Wing.—The following appointments are made:—  
Flight Commander.—Temp. 2nd Lieut. A. A. N. Pentland, Gen. List, from a Flying Officer, and to be Temp. Capt. whilst so employed; Sept. 18th.

Flying Officers.—2nd Lieut. J. J. A. Crozier, Lond. R. (T.F.), and to be confirmed in their rank; July 3rd. Lieut. (Temp. Lieut.) G. K. Rice-Oxley, A.S.C., S.R.; 2nd Lieut. (on prob.) N. C. Ashton, S.R.; July 16th. Temp. 2nd Lieut. A. A. Miles, Gar. Bn., Oxf. and Bucks L.I., and to be confirmed in their rank; Temp. 2nd Lieut. S. L. Hooper, B.W. Indies R.; July 21st. Lieut. R. Gore, Hrs., and to be confirmed in their rank; Lieut. J. D. Currie, High. L.I. (T.F.), and to be confirmed in their rank; 2nd Lieut. (on prob.) C. F. Cotton, Gen. List, and to be confirmed in his rank; 2nd Lieut. S. M. Sharpe, B.W. Indies R.; July 23rd. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—L. G. Candy; July 24th. F. Little; July 25th; Lieut. H. T. Thompson, R.F.A., S.R.; July 27th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—D. W. Mason; Aug. 27th. E. D. Aldridge; Sept. 3rd. Temp. 2nd Lieut. (Temp. Lieut.) C. T. Brown, Gen. List, from a Flying Officer (Ob.); Sept. 7th, with seniority from Sept. 1st, 1916. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—H. G. Hegarty; Sept. 8th. J. McD. Walker, A. H. Rudd, W. A. Booth; Sept. 10th. 2nd Lieut. (Temp. Lieut.) G. Bryers, North'd Fus. (T.F.), from a Flying Officer (Ob.), with seniority from Oct. 20th, 1916; Sept. 10th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—S. G. Pearson; Sept. 10th. W. L. Woodman, B. H. McLeod, E. B. G. Morton, G. S. Stewart, E. T. Baker, D. M. Christie; Sept. 11th. Temp. 2nd Lieut. P. T. Palmer, North'd Fus., and to be confirmed in their rank; Sept. 12th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—J. Adamson, A. M. Rogers, E. Whitfield, L. Marshall. Temp. Lieut. H. M. Hoskins, attd. N. Staffs. R., and to be confirmed in their rank; Sept. 13th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—F. G. Flower; Sept. 13th. W. R. Munro, F. H. Thompson. Lieut. F. A. Nicholson, Can. Inf.; Sept. 14th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—R. W. Redding, A. S. Cross, G. L. O'Neill, E. J. Bailey, I. F. Hind, L. T. Hogben, E. R. Latham, H. F. Meyer, R. B. E. Turnbull; Sept. 14th.

Flying Officers (Observers).—Capt. G. M. Puckridge, Devon R. (T.F.), and to be confirmed in their rank; Sept. 15th, with seniority from Aug. 14th; (Sept. 15th, with seniority from Aug. 15th). 2nd Lieut. B. R. Worthington, Yeo. (T.F.), and to be confirmed in their rank; Temp. 2nd Lieut. C. G. Vandyk, R.A., and to be confirmed in their rank; Sept. 15th. 2nd Lieut. J. G. Moore, Rif. Brig., and to be confirmed in their rank; Sept. 15th. 2nd Lieut. (Temp. Lieut.) J. Mcl. P. Adam, K.O. Sco. Bord. (T.F.), is April 5th, and not as in the Gazette of Aug. 24th.

Equipment Officers, 1st Class.—From the 2nd Class, and to be Temp. Capt. while so employed:—2nd Lieut. (Temp. Lieut.) H. J. de C. Moore, S.R.; Aug. 31st. Qrmr. and Hon. Lieut. (Temp. Lieut.) W. E. Aylwin, R.F.C.; Sept. 10th. 2nd Class.—Temp. Capt. F. J. Wise, Gen. List; July 2nd. From the 3rd Class:—Capt. H. A. Wilsdon, Oxf. and Bucks L.I. (T.F.); Aug. 11th. Temp. 2nd Lieut. L. A. Mudge, Gen. List, and to be confirmed in their rank; Temp. 2nd Lieut. (on prob.) C. J. Strother, Gen. List, and to be confirmed in their rank; Nov. 26th 1916. Lieut. P. Anderson, Arg. and Suth'd Highrs., from a Flying Officer; Sept. 1st. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—L. Howe; Sept. 12th. C. W. Ware; Sept. 18th.

Experimental Officer, 3rd Class.—Graded as an Equipment Officer, 3rd Class.—The date of the seniority of 2nd Lieut. (Temp. Lieut.) W. W. Stainer, R. Suss. R. (T.F.), is May 22nd, 1916, and not as in the Gazette of Sept. 17th.

Schools of Instruction.

Schools of Military Aeronautics.—Instructor.—Graded as an Equipment Officer, 1st Class.—2nd Lieut. (Temp. Lieut.) W. N. Cronshaw, E. Lan. R. (T.F.), from an Asst. Inst. (graded as an Equipment Officer, 2nd Class), and to be Temp. Capt. whilst so employed; July 6th.

School of Technical Training.—Chief Instructor.—Graded as a Park Comdr.—Lieut. (Temp. Capt.) C. G. Tucker, S.R., an Equipment Officer, 1st Class, and to be Temp. Major whilst so employed; Sept. 10th.

General List.—2nd Lieut. (Temp. Lieut.) E. S. Cohen, S.R., an Equipment Officer, 2nd Class, and to be Temp. Capt. whilst specially employed, vice Lieut. (Temp. Capt.) C. H. Awcock, R.A., who relinquishes his temp. rank; Aug. 11th. 2nd Lieuts. to be Temp. Lieuts.:—M. G. Sykes, Ind. Army Res. of Off.; L. H. Forrest, Ind. Inf.; A. G. V. Taylor, Ind. Army; H. F. Knight, Ind. Army Res. of Off.; E. H. P. Jolly, Ind. Army Res. of Off.; O. S. Waymouth, Ind. Army Res. of Off.; Sept. 1st. Temp. 2nd Lieut. A. Ashurst to be Temp. Lieut.; Sept. 1st. 2nd Lieut. F. F. Bramwell, E. Afr. Protectorate Force, to be Temp. 2nd Lieut.; June 6th, seniority Oct. 30th, 1916. Qrmr.-Sgt. I. Powell, from R. Lanc. R., to be Temp. 2nd Lieut. (on prob.); Sept. 10th.

General List (R.F.C.).—Cadets to be Temp. 2nd Lieuts. (on prob.):—W. H. Askew, G. M. Atkinson, P. A. Anderson, A. W. Bennett, T. L. Bourke, J. Boydell, J. Bradbury, C. A. Bryant, V. Beecroft, H. E. Blight, L. C. W. Bauchope, A. G. Baker, A. V. Branson, O. M. Baldwin, G. A. Bloomfield, J. E. E. Bushell, W. Bull, R. J. Costigan, S. F. Culver, F. A. Coutts, H. W. Campbell, M. G. Carmody, R. C. Cain, J. T. Denman, E. O. Danger, F. C. Daniel, S. Davison, H. Ebrey, W. K. Fenn-Smith, E. J. Foulkes, G. L. J. Forrest, J. W. Ganderon, E. G. Glasson, A. McC. Goddard, J. W. Gillis, H. F. K. Greaves, G. H. Glasspole, S. Gillatt, M. H. Hanrahan, W. F. Hargreaves, N. A. Holmes, D. C. Inglis, M. R. Jacobs, C. H. R. Lagesse, R. A. Lane, H. S. Lewis, H. L. LeRoy, B. O. M. Linford, J. C. Langford, W. M. MacDonald, H. T. W. Manwaring, E. H. Masters, N. R. Melville, H. J. Miles, L. J. Minter, H. J. Mulroy, F. L. Munslow, D. F. Murmann, R. Neish, C. N. Prentice, E. R. Prideaux, N. F. Purser, J. H. Ratcliff, V. J. Reading, S. T. Rekofski, S. F. Rich, R. C. Richards



E. S. Robson, D. M. Sage, R. J. W. Saubridge, R. Scott, S. St. C. Stone, H. Sugden, R. B. Tapp, G. W. Taylor, A. E. Wale, F. H. Watts, W. S. Wheeler, H. V. Whitaker, H. R. Wright, J. Wilkinson, J. A. Yates; Sept. 26th. F. Abrahams, J. Adam, C. P. Allen, G. M. Anderson, C. M. Armstrong, L. Arnott, S. C. J. Askin, W. T. J. Atkins, T. Bailes, A. Baker, B. C. K. Bayly, D. B. Barbour, R. H. Barker, W. Barr, A. R. Bell, H. Beresford, L. S. Birch, H. P. Blake, R. P. Brailly, R. E. Bright, G. G. Bartlett, H. S. Basford, R. E. Bowron, F. R. Brand, W. G. Brind, C. Brown, R. Brown, E. Bryant, T. Buchanan, W. B. C. Buchanan, H. G. Buckley, W. J. Burns, E. Bushell, R. G. Carr, C. G. Catto, E. M. Cheshire, J. A. Chubb, W. E. Clarkson, H. G. Cleaver, J. K. Clifford-Jones, W. Corder, F. A. Crowley, G. S. Dalglish, J. Davenport, S. A. Davis, M. C. Dick, C. J. Donnellan, W. Doyle, W. Drage, A. T. Dunlop, W. S. Emmott, S. L. Empson, L. R. Evershed, D. Ferguson, J. C. Fitton, W. T. Galbraith, S. C. Gilbert, E. V. Giles, D. V. Gillespie, G. J. Glazier, H. B. Good, J. K. Grant, J. R. Greasley, H. E. Grove, P. F. Gyles, E. Haigh, N. Haigh, C. J. Hall, W. C. M. Harbottle, V. T. Hardwood, J. B. Hatley, B. E. Hawkins, J. Headlam, E. Henriques, H. W. Heslop, V. G. Hinds, A. S. Houston, J. S. Howard, G. Hudson, K. P. Hunt, R. Ivelaw-Chapman, P. E. Jackman, H. G. Jackson, I. I. Jones, T. B. Jones, O. J. F. Jones-Lloyd, D. H. Keevil, E. V. Kennedy, G. Langstone, H. F. D. Lay, G. W. T. Latimer, A. Leiper, G. B. Leslie, H. F. Letten, K. V. C. Lewis, A. F. Lingard, N. C. Macdonald, C. R. Macnamara, G. H. Malone, C. J. Mason, W. A. Marshman, P. Mason, H. McDonald, W. McIntosh, G. P. McIntyre, D. Menzies, G. A. R. Mergard, W. L. Milburn, J. H. Mitchell, S. J. Mitchell, R. Moore, C. L. Morley, J. Morton, J. M. E. Murray, T. S. Nash, J. C. Nuttall, H. V. Oldman, W. Oram, E. A. Parnell, I. K. Patton, D. S. T. Pettitt, C. de B. Pequegnat, J. Pitt, F. J. E. Pullen, G. S. Ramsay, T. Rawsthorne, F. S. Riley, V. R. Roberts, J. C. Robinson, H. F. W. Robinson, C. H. Ryley, E. G. F. Salmon, S. McL. Sclanders, T. Scott, T. W. Sleight, R. A. Slipper, W. A. Smart, E. Smith, C. G. H. Smith, G. W. K. Smith, H. A. Sparks, A. H. B. Stace, F. G. M. Stennett, W. C. Stewart, J. H. Stewart, J. Stuart, W. M. Tait, L. C. Taylor, W. C. Tempest, A. J. B. Thompson, C. W. McK. Thompson, G. T. Verrall, R. T. T. Waring, D. Watt, C. B. Weston, C. H. Westwater, L. S. Wooding, L. A. Wykes, P. F. C. Howe, L. G. Smith, S. L. Stern, S. G. Coates, F. L. Collinson, F. H. Hayns, F. R. Murray, D. E. Webb; Sept. 27th. H. O. Thornton; Sept. 28th.

#### London Gazette Supplement, October 4th.

The following appointments are made:—

**Squadron Commander.**—2nd Lieut. (Temp. Capt.) J. T. P. Whittaker, M.C., A.S.C., from a Flight-Comdr., and to be Temp. Maj. whilst so employed; June 21st (substituted for notification of August 31st).

**Flight-Commanders.**—From Flying Officers, and to be Temp. Capts. while so employed:—Temp. 2nd Lt. A. C. H. Groom, Gen. List; Sept. 18th. Lt. R. Duncan, Canadian Local Forces; Sept. 19th.

**Flying Officers (Observers).**—Lt. F. G. Mathers, Canadian Inf.; September 15th, seniority March 19th. Lt. C. G. Clay, Notts and Derby R. (T.F.), seniority April 13th, and to be sec'd.; Capt. C. H. M. Willson, L'pool R. (T.F.), seniority May 10th, and to be sec'd.; Sept. 16th. Lt. H. W. R. Banting, R.E., S.R., seniority June 1st; 2nd Lt. J. S. Millar, Sco. Rif., seniority June 18th, and to be sec'd.; 2nd Lt. V. G. Emery, Yeo. (T.F.), and to be sec'd.; September 15th, seniority July 6th; September 11th. Temp. 2nd Lt. S. Sutcliffe, R.W. Fus., seniority July 15th, and to be transferred to R.F.C. Gen. List; Temp. 2nd Lt. (on prob.) L. F. Ebbutt, Gen. List, seniority July 22nd, and to be confirmed in his rank; 2nd Lt. D. M. Cameron, High. L.I. (T.F.), seniority July 30th, and to be sec'd.; 2nd Lt. H. J. P. Bomford, Lond. R. (T.F.), seniority August 6th, and to be sec'd.; September 16th.

**Equipment Officers (3rd Class).**—Temp. 2nd Lt. A. H. Brown, Gen. List (December 6th, 1916); Temp. 2nd Lieut. (on prob.) F. Adams, Gen. List, and to be confirmed in his rank; July 25th.

#### London Gazette Supplement, October 5th.

The following to be 2nd Lieut. for service in the field:—

**R.F.C.**—Actg. Sergt.-Major J. H. Ferguson; Aug. 1st. Sergt.-Maj. F. C. Griffin, Sergt.-Major C. W. Brown; Sept. 3rd.

The following to be Temp. 2nd Lieuts.:—

**R.F.C.**—Sergt. W. F. Mayoss; Sept. 1st. Flight Sergt. W. W. Grant; Sept. 5th.

The following appointments are made:—

**Staff Officer, 2nd Class.**—(Graded as a Brig. Maj.)—Maj. A. H. W. E. Wynn, Ind. Inf.; Sept. 10th.

**Flight Commander.**—2nd Lieut. A. C. Youdale, S.R., from a Flying Officer, and to be Temp. Capt. whilst so employed; Sept. 21st.

**Flying Officers.**—Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—G. A. Hunt; Sept. 4th. W. H. R. Gould; Sept. 7th. P. J. Cox, S. T. Horry, S. B. Reece, D. G. Cooke, Lieut. F. H. Taylor, Can. Inf.; Sept. 10th. Temp. 2nd Lieut. (on prob.) G. Cowie, Gen. List, and to be confirmed in his rank; Lieut. C. Smythe, M.C., Can. Art.; Lieut. W. M. Emery, Divl. Sig. Co., Can. Engrs.; 2nd Lieut. (on prob.) S. J. Brewer, S.R., Sept. 11th; 2nd Lieut. (on prob.) J. E. Blair, Gen. List, and to be confirmed in his rank; Lieut. L. Kert, Can. Railway Troops; Sept. 12th. Temp. 2nd Lieut. (on prob.) E. D. Dalmaigne, Gen. List, and to be confirmed in his rank; Lieut. J. P. B. Harold, R.F.A., S.R. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—H. C. Kelly, H. M. Schlotel, S. J. Broderick, Sept. 13th. Temp. Lieut. F. R. C. Cobbold, Gen. List, from a Flying Officer (Ob.), seniority from Aug. 4th, 1916; Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—C. F. Cunningham, S. S. Henry, C. Ross, R. Hood, H. T. Adams; Sept. 14th. A. E. Turvey, H. N. Young, 2nd Lieut. J. Edelsten, Dorset R. (and to be sec'd.); Sept. 15th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—E. D. Scott, J. L. McAdam, A. R. Hungerford; Sept. 16th. 2nd Lieut. G. M. A. Hobart-Hampden, Oxf. and Bucks L.I. (since killed), from a Flying Officer (Ob.), seniority from Dec. 16th, 1916; Temp. 2nd Lieut. M. E. Mealing, Shrops L.I., from a Flying Officer (Ob.), seniority from Aug. 7th, 1916; Sept. 17th.

**Balloon Company Commander.**—Graded as a Flight Commander.—Capt. G. F. M. Warner, R. Berks. R., from a Balloon Officer; Aug. 1st.

**Balloon Officers.**—2nd Lieut. (Temp. Lieut.) U. A. Currie, High. L.I. (T.F.); Temp. 2nd Lieut. W. C. Strickland, Worc. R.; Temp. 2nd Lieut. (on prob.) H. Roberts, Gen. List, and to be confirmed in his rank; Sept. 13th.

**Adjutant.**—Temp. 2nd Lieut. R. A. Wilton, M.C., R. War. R., to be transfd. to R.F.C. Gen. List, and to be Temp. Capt. (with pay and allowances as Lieut.) whilst so employed; Sept. 19th.

**Equipment Officers, 1st Class.**—From the 2nd Class, and to be Temp. Capts. whilst so employed:—Temp. Lieut. H. N. Nowell, Gen. List; Lieut. P. Adams, S.R.; 2nd Lieut. (Temp. Lieut.) D. W. Wilson, S.R.; Aug. 31st. 2nd Lieut. (Temp. Capt.) J. Pearce, K.O.S.B., from an Instr. (graded as an Equipment Officer, 1st Class), Armament School, and to retain his temporary rank whilst so employed; Sept. 25th.

**2nd Class.**—From the 3rd Class, and to be Temp. Lieuts. whilst so employed: Temp. 2nd Lieut. L. J. E. Jenner, Gen. List; 2nd Lieut. D. Smith, S.R.; 2nd Lieut. G. W. Longstaff, S.R.; Aug. 31st. From the third Class:—Temp. Lieut. W. E. Gower, M.C., Gen. List; Lieut. W. Yonge, S.R.; and to be Temp. Lieuts. whilst so employed:—Temp. 2nd Lieut. J. Durward, High. L.I.; Temp. 2nd Lieut. F. R. H. Logan, Gen. List; 2nd Lieut. R. F. P. Hocker, S.R.; Sept. 11th.

**3rd Class.**—Temp. Capt. F. J. Wise, Gen. List; July 1st. Temp. 2nd Lieut. C. S. Willmott, Gen. List; July 16th. 2nd Lieut. A. Ledger; Sept. 12th.

The appointment of Temp. 2nd Lieut. L. C. Bygrave, notified in the *Gazette* of Sept. 17th, is antedated to Aug. 13th.

**General List.**—Temp. 2nd Lieuts. to be Temp. Lieuts.:—R. C. G. Rowden, G. S. Morgan; July 1st. E. J. Detmold, C. S. Fulton, C. A. Mercer, J. T. Kyffin, O. A. E. Allen, J. B. Hinchcliff, N. W. Birkett, L. Murray-Stewart, D. G. O'Reilly, A. G. Graves, A. E. Young, A. P. Boor, H. K. Gibson, W. A. Holland, G. G. Jackson, A. G. Mortlock, C. H. Adamson, H. T. W. Oswald, R. H. Dunlop, B. E. Berrington, J. R. Currington, E. J. Leech, S. A. Martin-dale, H. E. Ranson, J. Wedgwood, H. Lambert, L. Lucas, J. E. Doyle, H. J. W. Collins, A. H. Carman, J. A. Harman, C. H. Mather, H. J. McCracken, M. P. Lewis, J. C. A. Cameron, C. F. Overy, A. J. Tyler, D. Lindlay, G. B. Monkman, W. G. Duthie, S. N. Veitch, R. V. Walker, M.C., D. Shanks, H. B. Hurst, H. N. Lett, L. D. Kirk, R. K. Morris, D. Maclean, V. J. Woodcock, L. C. Atwood, J. A. Turnbull, E. J. Stockman, R. Ferguson, C. R. Lamrock, H. J. Scales, C. E. Ward, H. G. W. Debenham, W. H. Park, D. H. Robertson, J. H. Cross, G. Hodgson, W. S. Philcox, S. A. Gibbons, S. T. Smith, C. M. White, G. W. Shuter, E. H. Comber-Taylor, J. Lawson, T. Durrant, H. J. Ball, J. R. Cudemore, C. A. F. Rogers, A. A. N. Pentland, H. A. Blanchard, O. Matson, J. J. Paine, C. A. Angrave, A. S. Talbot, T. B. Tully, E. F. Hall, O. W. de Putron, E. O. Johnson; Sept. 1st. 2nd Lieut. D. P. FitzG. Uniacke, R. Ir. Rif., to be Temp. Lieut.; Sept. 1st. Temp. 2nd Lieut. S. C. B. West resigns his commission; Oct. 6th. Temp. Sgt.-Major A. Ledger, from R.F.C., to be 2nd Lieut.; Sept. 10th. Sgt.-Pilot G. Fineran, from R.F.C., to be Temp. 2nd Lieut.; Sept. 20th. To be Temp. 2nd Lieuts. (on prob.): 1st Class Air-Mech. A. D. Simmonds, from R.F.C.; July 17th. D. Webber-burn, late 2nd Lieut. S. Air. Forces; Aug. 19th. Sgt. R. H. Nicol, from R.E.; Sept. 6th. W. J. Rose, Sir H. G. de Bathe, Bt., W. H. Shorter, J. C. Corbin, F. Child, W. Neilson, G. P. S. Sanday, J. R. Wilcox, T. L. Rhodes, late Temp. Capt., W. York R., R. B. Aitken, T. Goulding, C. H. Strike, C. H. Bull, K. Gray, F. G. Rison, A. Ford, C. J. Ashdown, J. O. Furber, M. J. Curtis, L. G. Coxhead, W. C. Downen; Sept. 21st.

#### Supplementary to Regular Corps.

2nd Lieuts. (Temp. Maj.) to be Lieuts.:—G. I. Taylor; Sept. 1st. H. G. Gold; Sept. 3rd. 2nd Lieuts. (on prob.) confirmed in their rank:—T. L. Gitsam, H. E. Jones, N. C. Ashton, R. L. Lyster-Smythe, C. Knowles, S. P. Ashton, S. L. Crowther, G. F. P. Warren, F. H. Goodwin, L. F. Bennett.

**General List.**—Temp. 2nd Lieut. J. Taylor resigns his commission owing to physical unsuitability for retention in the Corps; Oct. 6th.

#### London Gazette Supplement, October 6th.

The following appointments are made:—

**Flight Commander.**—Lieut. G. T. Willcox, High. L.I. (T.F.), from a Flying Officer, and to be Temp. Capt. whilst so employed; Sept. 21st.

**Flying Officers.**—Temp. 2nd Lieut. (on prob.) A. P. Hutton, Gen. List, and to be confirmed in his rank; Sept. 15th. Temp. 2nd Lieut. M. Andrews, Gen. List, Temp. 2nd Lieut. G. Fineran, Gen. List; Sept. 20th. Temp. 2nd Lieut. A. Armstrong, Gen. List; Sept. 24th.

**Flying Officers (Observers)** (Sept. 18th).—2nd Lieut. G. F. Dell, York. R. (T.F.), seniority July 4th, and to be sec'd.; 2nd Lieut. A. C. T. Perkins, R.G.A., S.R., seniority July 23rd; Lieut. W. W. Chapman, E. Kent R., S.R., seniority Aug. 7th, and to be sec'd.

**Assistant Instructors in Gunnery.**—(Graded as Equipment Officers, 3rd Class)—Temp. Lieut. H. G. Hall, M.G. Corps, and to be transfd. to R.F.C., Gen. List; Temp. Lieut. G. H. Whitaker, M.G. Corps, and to be transfd. to R.F.C., Gen. List; 2nd Lieut. W. E. Hinton, R. Lanc. R. (T.F.), from Temp. Lieut., M.G. Corps; Temp. Lieut. F. C. Butler, Gen. List, from a Flying Officer (Ob.); Temp. 2nd Lieut. H. R. Poole, Gen. List, from a Flying Officer; Temp. 2nd Lieut. J. R. Shanks, attd. R. Scots, and to be transfd. to R.F.C. Gen. List; Temp. 2nd Lieut. C. P. Beadon, Gen. List, from a Flying Officer; Temp. 2nd Lieut. (on prob.) H. A. Dunningham, Gen. List, and to be confirmed in his rank; Lieut. J. H. Turner, D. Gds., and to be sec'd.; Lieut. H. Forbes, Lond. R. (T.F.), from M.G. Corps; Temp. Lieut. C. M. Pletts, M.G. Corps, and to be transfd. to R.F.C. Gen. List; Temp. Lieut. J. P. Bown, M.G. Corps, and to be transfd. to R.F.C. (Gen. List); Temp. 2nd Lieut. C. T. Clarke, M.G. Corps, and to be transfd. to R.F.C., Gen. List; Temp. 2nd Lieut. F. G. Brockman, Gen. List, from a Flying Officer (Ob.); Sept. 18th.

**Equipment Officers, 2nd Class.**—2nd Lieut. (Hon. Capt.) A. V. Hambro, T.F. Res.; Aug. 10th.

**3rd Class.**—Temp. 2nd Lieut. W. S. Vale, Gen. List; June 4th.

**Adjutant.**—2nd Lieut. H. O. Barnaby, R.F.A. (T.F.), from Act. Lieut., R.A., and to be Temp. Capt. (with pay and allowances as Lieut.) whilst so employed, vice Capt. P. A. Landry, Can. Inf.; Sept. 6th.

#### Central Flying School.

**Instructor.**—Lieut. (Temp. Capt.) H. W. G. Jones, M.C., Welsh R. (T.F.), a Flight Comdr., vice Capt. (Temp. Major) G. Allen, Conn. Rang.; Aug. 2nd.

**General List.**—Temp. 2nd Lieuts. to be Temp. Lieuts.:—M. V. McKeon, S. Adler, G. H. Hackwill, V. W. Harrison, H. L. Chadwick, K. A. Creery, R. Chadwick, G. W. Lynn, L. T. Smith (Gen. List), A. J. O'Byrne, Gen. List; Aug. 31st. C. P. Lowry, Gen. List; Sept. 1st. 2nd Lieuts. to be Temp. Lieuts.: V. Bayley, L'pool R.; Aug. 31st. G. Rodgers, W. Rid. R. (T.F.); Sept. 1st. Sgts., from R.F.C., to be Temp. Lieuts.:—M. Andrews; Sept. 20th. A. Armstrong; Sept. 24th.

#### Supplementary to Regular Corps.

2nd Lieut. H. R. Williamson resigns his commission; Oct. 7th.

**General List.**—Temp. 2nd Lieut. G. R. Ranken resigns his commission with a view to joining an Inf. Off. Cdt. Bn.; Oct. 7th. Temp. 2nd Lieut. P. Rawsley resigns his commission owing to physical unsuitability for retention in the Corp.; Oct. 7th.

#### London Gazette Supplement, October 8th.

The following appointments are made:—

**Flight Commanders.**—From Flying Officers and to be Temp. Capts. whilst so employed:—Temp. 2nd Lieut. R. H. Ayre, Gen. List; Sept. 17th. Temp. Lieut. H. O. W. Hill, Gen. List; Sept. 21st.

**Flying Officers.**—Temp. 2nd Lieut. F. F. H. Bryan, Gen. List; Sept. 7th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—T. H. Hampshire, H. M. Gibbon; Sept. 10th. E. G. Latham; Sept. 11th. Temp. 2nd Lieut. R. Fletcher, Gen. List, from a Flying Off. (Ob.), seniority Sept. 21st, 1916; Sept. 11th. Temp. 2nd Lieut. (on prob.) M. M. Freehill, Gen. List, and to be confirmed in his rank; 2nd Lieut. L. C. Tims, R. War. R., and to be sec'd.; Temp. 2nd Lieut. W. W. McConnachie, M.G. Corps, and to be transfd. to R.F.C., Gen. List; Sept. 14th. Lieut. A. C. Lutyens, M.C., R.F.A., S.R., from a Flying Off. (Ob.), seniority Jan. 28th; Sept. 15th. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—G. T. Griffith, L. N. Franklin, E. C. Rogers; Temp. 2nd Lieut. C. S. Goodfellow, M.C., Gen. List, from a Flying Off. (Ob.); Sept. 16th, seniority Oct. 29th, 1916. Lieut. D. C. Wright, Canadian Inf.; Sept. 17th. 2nd Lieut. (on prob.) C. H. Newbold, S.R. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—K. G. P. Hendrie, C. W. Sowter, C. I. B. Voge, J. R. Black; Sept. 18th. R. B. Hooper; Sept. 19th.

**Assistant Instructors in Gunnery.**—(Graded as Equipment Officers, 2nd Class).—Temp. Capt. M. G. Millar, Gen. List; Temp. Lieut. H. T. Woodhead, Gen. List; Temp. Lieut. P. Middlemas, Gen. List; 2nd Lieut. (Temp. Lieut. A. W. Sutton, Durh. L.I. (T.F.); Feb. 21st. Temp. 2nd Lieut. G. B. Neale, Gen. List; April 20th.

**Adjutant.**—Capt. E. J. Needham, North'n R., S.R.; Sept. 19th.



**Special Appointment.**—(Graded as a Park Commander)—Lieut. (Temp. Capt. O. G. W. G. Lywood, Norf. R., from a Spec. Appt. (graded as an Equipment Off., 1st Class), and to be Temp. Major whilst so employed; Sept. 6th.

**Equipment Officers, 1st Class.**—Lieut. F. Tedman, S.R., from the 2nd Class, and to be Temp. Capt. whilst so employed; Sept. 1st.

**2nd Class.**—From the 3rd Class.—2nd Lieut. (Temp. Capt.) R. R. Prentice, S.R.; May 1st. And to be Temp. Lieut. whilst so employed:—Temp. 2nd Lieut. C. H. Simpson, Gen. List; July 3rd. Temp. 2nd Lieut. P. Ellis, Gen. List; July 5th. Temp. 2nd Lieut. C. M. Seth-Ward, Gen. List; Temp. 2nd Lieut. C. S. Willmott, Gen. List; July 17th. Temp. 2nd Lieut. J. M. Bell, Gen. List; July 19th. Temp. 2nd Lieut. W. J. King, Gen. List; July 29th. 2nd Lieut. F. N. D. Masters, R.F.A. (T.F.); Aug. 2nd. Temp. 2nd Lieut. H. N. Sandys, Gen. List; Aug. 5th. Temp. 2nd Lieut. R. C. Cox, Gen. List; Aug. 17th.

**3rd Class.**—Temp. Lieut. C. W. Jamieson, A.S.C., and to be transfd. to R.F.C., Gen. List; Sept. 1st. Temp. 2nd Lieuts. (on prob.), Gen. List, and to be confirmed in their rank:—A.D. Simmonds, A. E. Marriott; Sept. 5th.

**Officer in Charge of Stores.**—(Graded as an Equipment Officer, 2nd Class).—Temp. 2nd Lieut. H. E. Hotchin, Gen. List, from an Equipment Off., 3rd Class, and to be Temp. Lieut. whilst so employed; Sept. 10th.

**Schools of Instruction.—School of Technical Training.**  
**Assistant Commandant.**—(Graded as a Park Commander).—Capt. (Temp. Major) L. W. F. Turner, S.R., from a Chief Instr. (graded as a Park Comdr.), and to retain his temp. rank whilst so employed; Sept. 10th.  
**General List.**—The undermentioned 2nd Lieuts. to be Temp. Lieuts:—A. S. Keep, C. R. Coffey, E. Wilson; July 1st. H. E. Judge; Aug. 26th. 2nd Lieut. W. E. Knowlden, Bord. R., to be Temp. Lieut.; Sept. 1st. Temp. 2nd Lieuts. resign their commissions:—N. V. Schooley, O. P. Michell, D. Thomson; Oct. 9th. To be Temp. 2nd Lieuts. (on prob.):—E. L. Hocking; Sept. 21st. F. Waldron, late Temp. Lieut., Worc. R.; Sept. 24th.

**Supplementary to Regular Corps.**  
To be 2nd Lieuts. (on prob.):—R. J. Thompson, I. Carr, H. L. Bayly, A. E. Cheal; June 12th.

To notification referring to appointment of 2nd Lieut. (on prob.) R. L. Lyster, Smythe which appeared in *Gazette* of Oct. 5th, 1916, add "with seniority May 30th, 1915."

## Aeronautical Inspection Department.

*London Gazette Supplement, October 3rd.*  
To be Temp. Hon. Capt.:—Temp. Hon. Lt. R. E. Rollings, whilst employed as Inspector Aeronautical Inspection Department; Aug. 1st.



# AIRCRAFT WORK AT THE FRONT.

## OFFICIAL INFORMATION.

### British.

**General Headquarters, September 29th.**  
"On the 28th inst. artillery and photographic work was continued by our aeroplanes, and over 4 tons of bombs were dropped on the enemy's aerodromes at Gontrode and Carnières, and on hostile dumps, billets and railways. At night another 6 tons were dropped on similar targets, including the aerodrome at Gontrode, where the enemy's anti-aircraft guns, machine guns and search-lights were most active. In spite of the heavy barrage which was put up over the aerodrome all our machines returned safely. During these raids our aeroplanes again used machine-gun fire with good effect against all enemy troops and transport seen. As the result of air fighting nine German machines were brought down, and four others were driven down out of control. In addition, one enemy machine was shot down by our anti-aircraft guns. Three of our aeroplanes failed to return."

**War Office, September 29th.**  
"Mesopotamia.—On September 25th two of our aeroplanes engaged in reconnaissance on the Tigris north of Samarra failed to return."

[With regard to the loss of two aeroplanes, a report issued in Constantinople on September 27th said: "Two enemy aeroplanes which flew over our lines on the morning of September 24th were attacked by one of our aeroplanes, piloted by Prob. Flight Officer Reynier, who forced these two British machines to land in our lines. The pilots and observers of these machines—four unwounded British airmen—were made prisoners."]

**Admiralty, September 29th.**  
"During the night September 27th-28th bombing raids by naval aircraft were made on the following objectives: The lock gates at Zeebrugge, St. Denis Westrem Aerodrome, Gontrode airship shed, Houttave Aerodrome. The bombing-dropping at Zeebrugge appeared good, while at Houttave the bombs fell among hangars and huts on the south-west side of the aerodrome. In all 7 tons of explosives were dropped. All machines returned safely."

"A bombing raid was carried out on September 27th by naval aircraft on storehouses, &c., on the south-western side of Beirut harbour. Many direct hits were obtained, and fires were started. It was observed that damage caused to sheds as a result of the raid on August 18th was in course of repair. All our machines returned safely. The storehouses on the mole were afterwards shelled by a cruiser and set on fire."

**Admiralty, September 30th.**  
"During the afternoon of September 29th a bombing raid was carried out by naval aircraft on St. Denis Westrem Aerodrome. Many bombs were dropped and direct hits were observed among sheds and Bessonneaux tents. A bomb exploded amongst five machines lined up on the aerodrome. All machines returned safely."

**General Headquarters, September 30th.**  
"On the 29th inst. the weather was unfavourable for aerial work. A number of valuable photographs were taken, however, and some observation was carried out for the artillery. Bombing of the enemy's aerodromes, billets, dumps and railways was continued vigorously by our aeroplanes by day and night, and over 7 tons of bombs were dropped. Gontrode Aerodrome was the chief target for our machines, and a large fire was caused there. One of the enemy's balloon sheds also was set on fire and destroyed by a naval pilot. The enemy's fighting machines were not very active yesterday, and there were comparatively few combats. One German machine was brought down, and two of our aeroplanes are missing, one of which was seen to land under control."

**Admiralty, October 1st.**  
"During the night of the 29th bombing raids were carried out by naval aircraft over the following objectives: The lock gates at Zeebrugge, St. Denis Westrem Aerodrome, Thourout Aerodrome, Brugeoise Works and trains. Several tons of bombs were dropped, with good results, a large fire being caused at St. Denis Westrem Aerodrome. During patrol several aerial combats occurred, with the result that two enemy machines were destroyed and one was driven down completely out of control. A Gotha was also driven down, and it is thought to have been damaged. All our machines returned safely."

**General Headquarters, October 1st.**  
"Visibility improved on September 30th, and a great deal of artillery and photographic work was accomplished by our aeroplanes. Bombing was continued without respite by day and night, and over 11 tons of bombs were dropped on the enemy's aerodrome at Gontrode, on hostile billets and communications in the battle area, and on a dump and headquarters near Cambrai. The enemy also carried out many bombing raids during the night, but did little damage of military importance. A photograph taken of the results of our bombing at Gontrode Aerodrome shows that on the night of September 29th-30th one of the sheds at the aerodrome was hit. The same photograph shows that three large German machines have landed in a field 5 miles south of Gontrode Aerodrome. Two of the machines are clearly damaged, and reconnaissance carried out to-day found all three machines still lying in the field. The large airship shed which is now used for the accommodation of Gotha aeroplanes at this aerodrome is reported to have been set on fire last night. Enemy aircraft were not very active yesterday, but a few large formations were encountered. Four German machines were brought down and eight were driven down out of control. Five of our aeroplanes are missing."

**Admiralty, October 2nd.**  
"During the night of Sept. 30th naval aircraft dropped bombs on St. Denis Westrem Aerodrome, which fell among the hangars and set fire to one on the south side. The fire spread, and was visible 30 miles away. Bombs were also dropped on Zeebrugge lock-gates. Another bombing raid on St. Denis Westrem

was carried out by day at 12.30 p.m. on Oct. 1st, several direct hits being observed. also two sheds on fire in the south-east corner of the aerodrome. The large shed on the south side of the aerodrome reported as being hit and set on fire on Sunday night appears to be completely gutted. All machines returned safely."

**Admiralty, October 3rd.**  
"During the night of Oct. 1st-2nd a bombing raid by naval aircraft was carried out on lock-gates at Zeebrugge. Many bombs were dropped. Yesterday afternoon an attack was made on St. Denis Westrem Aerodrome, where a quantity of explosives was dropped on sheds and machines. During usual fighter patrols two enemy aircraft were shot down out of control. All our machines returned safely."

**General Headquarters, October 3rd.**  
"On the 2nd inst. weather was again misty, but in spite of this much successful observation work was done for the artillery, and many photographs were taken. Some of these showed the damage done by our bombing raids. About 8 tons of bombs were dropped by our aeroplanes on various targets, and hits were observed on three aerodromes in the Courtrai area, and on a fourth near Cambrai. Huts and dumps near Douai and sidings at Roulers were also successfully attacked. The enemy generally avoided our fighting aeroplanes, but attacked our long-distance bombing machines vigorously when far east of the line. Six German machines were brought down in air fighting, and four others were driven down out of control. Six of our aeroplanes are missing."

**Admiralty, October 4th.**  
"Bombing raids were carried out during yesterday by naval aircraft on the following objectives: St. Denis Westrem, Zeebrugge lock gates, Bruges dock and other targets, Thourout railway junction. All our machines returned safely."

**General Headquarters, October 4th.**  
"On the 3rd inst. low clouds and a high west wind made aerial work almost impossible. In spite of these conditions a little artillery work was carried out, and four of our machines attempted to bomb one of the enemy's aerodromes. One of these machines reached and bombed its objective, and two succeeded in dropping their bombs on other targets behind the enemy's lines. Very few hostile aircraft were seen. One German aeroplane was driven down out of control, and one of our machines is missing. Later reports show that a seventh hostile machine was brought down on the 2nd inst. in addition to the six already reported."

**War Office, October 4th.**  
"Salonica.—Our aeroplanes have carried out a most successful raid on an extensive scale, bombing the enemy's camps and dumps of the Belashitza Planina. Hostile troops were scattered by machine gun fire, and one of several enemy aeroplanes, which attacked our formation, was brought down near Matnica (north-west of Poroi). All our machines returned safely."

**General Headquarters, October 5th.**  
"On Thursday the weather was almost impossible for flying, but, in spite of rain, low clouds, and exceptionally strong wind, our artillery machines watched our advancing troops and reported their positions and the movements of the enemy. Some of our fighting scouts flew over and attacked troops, transport, and guns from the air. One of our machines is missing."

**General Headquarters, October 6th.**  
"The weather on the 5th inst. continued to be unsettled and stormy, and again made flying difficult. Successful artillery work was nevertheless accomplished and many photographs were taken. Enemy aerodromes in the Lille area were attacked with bombs. Railway stations at Westroosebeke, Iseghem, and Courtrai were attacked during the day, the latter two were also attacked at night, and over two tons of explosives were dropped. Enemy aircraft were active in the battle area. Four of his machines were brought down out of control. Five of our machines are missing."

**General Headquarters, October 7th.**  
"The weather was still very unfavourable for flying on the 6th inst., but a little artillery work was done. One and a-half tons of bombs were dropped on enemy targets, including a railway station, and our fighting machines went out whenever possible. One failed to return. A bombing machine is also missing, which went out on the night of Oct. 4th-5th."

**War Office, October 8th.**  
"Salonica.—Our aeroplanes co-operated by dropping bombs on the enemy's batteries and engaging his infantry with machine guns.  
"Our aircraft have also carried out bombing raids on Ciftlidzik (west of Demir Hissar), where a hostile anti-aircraft gun was put out of action, and on Cestovo (north-west of Lake Doiran), where an ammunition dump was damaged."

**General Headquarters, October 8th.**  
"There was a short spell of fair weather yesterday before the heavy rain, which fell almost all day. While this lasted considerable work was done by our artillery machines and our bombing machines dropped over 2½ tons of explosives on Staden and Courtrai railway stations and other targets. The enemy showed marked activity in the vicinity of our newly-won territory and attacked our bombing machines vigorously. Two hostile machines were brought down and three were driven down out of control. One of our machines is missing."

**French.**  
*Paris, September 29th.*  
"During the night of September 27th our squadrons bombarded the aviation grounds at Staden, Roulers and Cortemarck, and the camps in the vicinity.  
"German aeroplanes bombarded the region of Bar-le-Duc."



Paris, October 1st.

"Enemy airmen last night bombarded the region of Bar-le-Duc, causing some material damage and several victims. During the day of September 30th five German aeroplanes were brought down in the course of aerial fights. Seven other enemy machines fell smashed within their lines. Our bombarding squadrons showered projectiles on the station and cantonments at Fresnoy-le-Grand, where violent fires were observed, as well as on the stations of Thionville, Mézières and Dieuze and the factories of Hagondange. As a reprisal for the bombing by the Germans of the open town of Bar-le-Duc, two of our aeroplanes during the night of September 30th-October 1st dropped 300 kilogrammes of projectiles on the fortified town of Stuttgart. In Belgium we bombarded the aviation grounds in the region of Roulers and Thielt, the stations of Lichtervelde, Staden, Cortemarck, &c.

"Some German aeroplanes bombarded the region of Dunkirk on the 27th, 28th and 29th. The two first bombardments only caused material damage. The last, which was particularly violent, resulted in the death of several victims. Two German machines were brought down by our pilots during the day of the 29th. During the night of the 28th the railway station of Colmar and the enemy establishments to the north of Soissons were visited by our aeroplanes. 4,000 kilogrammes of bombs were dropped with success."

Paris, October 2nd.

"Last night German aeroplanes dropped bombs on Toul. Several casualties are reported.

"On the 1st inst. a heavy ground mist hindered aerial work until the evening. Some successful observation was then accomplished for the artillery, and our aeroplanes took many photographs. Bombing was again carried out by day and night. Gontrode aerodrome was twice attacked, and several bombs were observed to burst on the sheds. Carnières aerodrome, near Cambrai, was also bombed, and a large hangar was hit. Two attacks were made on a German long-range gun and two others on hostile billets in the battle area. During the month of September 125 tons of bombs have been dropped by our aeroplanes on various enemy depôts. Hostile aircraft were not particularly active during the day, but carried out some bombing by night. Five German machines were brought down and three others driven down out of control. Two of our aeroplanes are missing.

"German machines last night once more attacked the town of Dunkirk. The very violent bombardment caused some serious material damage. Numerous victims are reported among the civil population. As a reprisal for the bombing done by the Germans on Dunkirk and Bar-le-Duc, our aviators during the night of Oct. 1st-2nd launched bombs on the cities of Stuttgart, Treves, Coblenz, and Frankfurt-on-Main. Our bombing machines also made numerous sorties, in the course of which 2,120 kilos. (over two tons) of explosives were thrown on the depôts of Roulers, 6,000 kilos. (6 tons) on the railway stations of Metz South, Woippy, Thionville, the aerodrome of Chambley, the bivouacs of Spincourt and Tilly, and the munition depôt of Longeau Farm, where a violent explosion is reported. During the day of Oct. 1st two German machines were brought down by our pilots and four were forced to land damaged."

Paris, October 4th.

"As a reprisal for the bombardment of Bar-le-Duc our aircraft bombarded Frankfurt and Rastatt."

Italian.

Rome, September 29th.

"Our air attacks were concentrated on the military zone of Voiscizza (Carso), which was effectively bombarded with about 3 tons of bombs, and on the fortified maritime centre of Pola, where the submarine base and the Arsenal were again bombed with numerous projectiles by a strong bombardment squadron.

"An enemy machine was forced to land in the plain of Santa Lucia (Tolmino), where it was subsequently destroyed by our artillery.

"Last night hostile aircraft dropped incendiary bombs on the town of Palmanova. Very slight damage and no casualties."

Rome, September 30th.

"Air fighting was very brisk along the whole Julian front. Our air squadrons yesterday bombarded the enemy depôts at Berje (north-east of Nabresina), and last night the known military works of the fortress of Pola, with excellent results. The reaction of the enemy was vigorous everywhere. One of our machines did not return to its base. Two enemy aeroplanes brought down in aerial combat fell in the neighbourhood of Monfalcone and east of Ternova."

Rome, October 1st.

"During the night of September 29th-30th hostile aircraft dropped bombs on Palmanova, Aquileia, Monfalcone and other localities of the Lower Isonzo, without doing material damage. One woman was killed.

"On the night of September 29th, while squadrons of our Caproni aeroplanes were effectively carrying out a fresh attack on the naval base at Pola, enemy aeroplanes dropped bombs in the neighbourhood of Ferrara, causing some damage, but fortunately no victims.

"One of our groups of destroyers on patrol duty sighted, a little before midnight, a group of enemy destroyers supporting seaplanes which had attacked Ferrara. Our vessels determinedly attacked the enemy, and, seeing him immediately turn tail, pursued him, shelling him until they reached the barrage of the Parenzo batteries.

"Explosions were clearly observed on the enemy's vessels, which were hit again and again. Our vessels sustained no damage."

Rome, October 3rd.

"Air activity was very lively. During the day one of our squadrons carried out a bombardment on the railway station of Grahovo. Last night in two successive raids the military objectives of Pola were bombarded with 4 tons of projectiles and greatly damaged.

"Two enemy machines, brought down by our airmen, fell north of Auzza and near Podmelec."

Rome, October 5th.

"During the night of Oct. 3rd-4th one of our bombarding squadrons, composed



## THE DETERMINATION OF PARACHUTE VELOCITY.

UNDER this title we published an article in our issue of September 13th, page 950, in which, unfortunately, several errors crept in which were not noticed in time to make the necessary corrections. Although those readers who have been able to follow the author's arguments will no doubt have seen his meaning in spite of the errors, it is as well to have the matter set right for the sake of future discussions with the article as a basis. In the fourth line of the sixth paragraph of the first column the downward acceleration is given as  $g - Z^p V^2 A$ . This should read  $g - Z^p V^2 A$ . In the second column, a few lines below Fig. 2, in the equation

of a large number of machines, audaciously flew over the naval base of Cattaro. The enemy, who was surprised, replied by a violent fire, which was badly regulated. Our aviators on several occasions and with visibly efficacious results, hit torpedo-boats and submarines lying in the base."

Russian.

Petrograd, September 29th.

"On September 26th in the Tarnopol region, our airmen brought down two enemy machines, which fell into the enemy's lines. In the Husiatyn region our airman, Lieut. Okennen, brought down an enemy machine, which also fell into the enemy's lines. In this region our airmen, Ensigns Hirsanoff and Leman, brought down an enemy machine, but in this combat the machine of Ensign Hirsanoff was damaged and fell into the enemy lines. In the Focsani regions the Roumanian airman, Dragetchano, brought down an enemy machine whilst over the enemy lines.

"Our airmen dropped a few hundredweights of bombs on the enemy stores along the River Stokhod, on the villages of Cigany and Losyach, while south-west of Husiatyn our airmen dropped several hundredweights of bombs on Sorostkoff, where fires broke out and panic was observed. Our bomb-droppers returned all safe, despite the attacks of enemy airmen and the terrific fire of anti-aircraft guns."

Petrograd, September 30th.

"Near the village of Ohlenorovka, a German aeroplane was brought down by one of our 'Murometz' machines. On the same front one of our airmen, Lieut. Dobrukhotoff, brought down an enemy aeroplane, which fell in flames."

Petrograd, October 1st.

"On September 28th, in the region of Kovel, our airmen dropped on the enemy camps about seven hundredweight of bombs, and in the Buczac region our giant aeroplanes of the Murometz type dropped about 2 cwt. of bombs."

Petrograd, October 3rd.

"On Oct. 1st, on the south-western front, we had three aerial engagements with enemy machines. Our giant aeroplanes of the Murometz type dropped several tons of bombs on the village Korostkov, north-west of Husiatyn.

"Baltic Sea.—On Oct. 1st, during the night, the enemy undertook several air raids on Cerel and dropped a few bombs, which set on fire one of our magazines. Explosions followed. Several officers and sailors, who worked to extinguish the fire, perished. As reprisals our airmen dropped bombs on the camps situated on the Courland Coast.

"During Oct. 1st enemy hydroplanes tried once more to approach Cerel, but our airmen ascended to meet them, forced them to turn back, and to drop their bombs in the sea."

Petrograd, October 4th.

"Baltic Sea.—On October 2nd and 3rd enemy hydroplanes carried out several scouting raids on Cerel, in the island of Oesel, and on Ainazhi, forty miles south of Pernau. Supplementary reports establish the fact that the explosions at Cerel killed seventy and wounded forty-four persons, a total loss of 114."

Petrograd, October 6th.

"On October 4th, at 1.30 p.m., enemy aeroplanes raided the town of Galatz (Roumania). As a result of the dropping of bombs casualties occurred among the civilians and soldiers."

German.

Berlin, October 1st.

"English and French airmen, by the dropping of bombs, recently wrought considerable material damage in Belgian territory, their attacks also causing numerous victims amongst the civil population.

"Fourteen enemy airmen were shot down yesterday. Lieut. Gontermann achieved his thirty-seventh and thirty-eighth, and 1st Lieut. Berthold his twenty-seventh aerial victory."

Berlin, October 4th.

"Enemy airmen during the night of October 2nd attempted in numerous flights to make attacks on German soil. The attacks did not produce results of any kind. An enemy aeroplane came as far as the neighbourhood of Stuttgart, and dropped at Feuerbach six bombs, which caused small damage, but no casualties. The Lorraine industrial region was subjected to numerous attacks, which, however, as usual, thanks to our effective measures of defence, had only slight success. Only one enemy airman again succeeded in penetrating into the region of Dortmund (near Essen). He dropped on the railway at Dorstfeld (Dortmund South) six bombs, which damaged the tracks. In this attack one person was killed.

"One of the enemy airmen who during the night of October 2nd attacked Frankfurt was on the return flight forced to descend by German anti-aircraft measures. He is a sergeant, and his machine was a Sopwith one-seater No. 128. Some attacks during the night of October 2nd were also directed against Rastatt, Baden-Baden, and Tuebingen. Three bombs were dropped on the first two places causing some material damage. For what purpose the French make these attacks on open German towns is unclear. In Rastatt there are no military objectives, and the attacks on Tuebingen and Baden-Baden can only be considered as the outcome of a blind desire for destruction. The sanatoria at Baden-Baden and the hospitals at Tuebingen contain numerous severely wounded men who are there seeking recovery. Even the French will not dare to assert that attacks on hospitals far behind the front are of military necessity. By such barbarity the will to persevere can only be strengthened in the German people."

Berlin, October 5th.

"Photographs taken by our aviators confirm the conclusion that our bomb attacks on the fortress of Dunkirk caused great destruction in several quarters of the town, especially to the harbour, warehouses, and railway works. Considerable hindrance will have been caused thereby to the English reinforcements."

Berlin, October 6th.

"The stormy weather limited aerial activity. Five enemy aeroplanes were shot down. Lieut. Müller gained his twenty-ninth aerial victory."

$\kappa = \&c.$ , the letter  $h$  is separated from  $\cos$ , making that part of the equation read  $\cos \frac{h g^t}{\kappa}$  instead of  $\cosh \frac{g^t}{\kappa}$ . This mistake will be seen to have occurred again in the next equation, where  $h$  should be substituted for  $\kappa$ , so as to read  $\therefore h = \&c.$  The next equation is the worst offender, and should read  $\therefore e = \frac{e^{g^t/\kappa} - e^{-g^t/\kappa}}{2}$ . We trust that these

corrections of errors, which the careful reader will already have "spotted," will serve to clear up any doubtful points arising from the obscurity that may have been caused by the misprints.



### Casualties.

Sergeant CUTHBERT GODFREY BALDWIN, R.F.C. (Pilot), eldest son of the late Rev. A. G. Baldwin, Vicar of Burnopfield, Durham, and of Mrs. Baldwin, 2, Priory Villas, Friern Barnet, missing on November 3rd, 1916, is now officially presumed killed in action.

Captain FREDERICK LEYCESTER BARWELL, London Regiment and R.F.C., previously reported missing, now reported killed on April 29th last, aged 22 years, was the eldest son of Mr. and Mrs. Leicester Barwell, of The Tower, Ascot. On the outbreak of war he had just left Malvern College to enter Pembroke College, Cambridge, but at once enlisted in the Queen's Westminster Rifles, receiving his commission six weeks later. He went to France with his battalion on November 1st, 1914, and served there until August, 1915, when he had sick leave. He returned to the front in April, 1916, and in the following September was sent home slightly wounded. Last January he transferred to the R.F.C. He received his first flight, under instruction, on February 28th, and gained his pilot's certificate on April 9th, proceeding to the front on April 13th. He received his second star in April, 1915, and was promoted temporary captain on July 1st, 1916, and captain on April 28th last, the day before he was killed.

Major CHARLES MEREDITH BOUVERIE CHAPMAN (Squadron-Commander), M.C., Chevalier de l'Ordre de Leopold, Lieutenant "The Buffs," attached R.F.C., who died of wounds on October 1st, was the eldest son of Mr. and Mrs. William C. N. Chapman, Heppington, Canterbury, aged 25.

Second Lieutenant FRANCIS JACK CHOWN, R.F.C., killed in an aerial fight on Sept. 20th, was the only son of Dr. and Mrs. Chown, of Townshend, near Hayle, Cornwall. He was educated at Temple Grove, and St. Paul's School. He passed for Sandhurst, but entered the R.F.C. direct from school in July, 1916, and got his "wings" in May, 1917, when he was appointed an assistant instructor. He volunteered as a scout, and went to France on Aug. 18th. On Sept. 20th he was out on a special mission, when he was attacked by four Hun machines, which had got behind our barrage. His machine was seen to come down out of control and crash within our lines.

Second Lieutenant W. CECIL FENWICK, R.F.C., reported missing on October 7th, 1916, now known to have been killed on that date in air fighting on the Somme, was the eldest son of Mr. and Mrs. C. F. Fenwick, of 3, Tring Avenue, Ealing, aged 19 years.

Flight Sub-Lieutenant ERIC CROWTHER HILLABY, R.N., the second son of Dr. and Mrs. A. Hillaby, The Limes, Pontefract, who was previously reported missing on July 6th, 1917, is now reported by the Admiralty as killed on that date, aged 19. He joined the Grahame-White School of Aviation in January, 1916, and after a short course of instruction gained his pilot's certificate, and was gazetted Flight Sub-Lieutenant in August, 1916.

It is reported that Lieutenant G. ERIC MIAL-SMITH, M.C., R.F.C., aged 22, son of Mr. and Mrs. G. A. Mial-Smith, Fern Lodge, Millfield Lane, Highgate, has fallen in action. Lieutenant Mial-Smith had been twice wounded. His only brother, Arnold, lieutenant in the Royal Fusiliers, was killed in September of last year.

Lieutenant EDWARD HORACE PEMBER, R.F.A. and R.F.C., who was killed on September 30th, aged 19, was the only surviving son of the Warden of All Souls' College, Oxford. He was educated at Mr. L. T. Thring's School at Hove and at Harrow, where he was in Mr. A. Vassall's house. In 1910 he won an entrance classical scholarship at Harrow, and in 1914 he was elected to a mathematical exhibition at Balliol College, Oxford. At Harrow he was a member of the O.T.C., and in the school shooting eight in 1915. He received his commission in the R.F.A. in July, 1915, went out to Suvla Bay in the following November, and, after the evacuation, was for some months in Egypt with his battery. In the autumn of 1916 he joined the R.F.C.,

and he had been flying at the front since the first week in May. On the morning of September 30th he was flying over the enemy's lines taking photographs, when he was attacked by four enemy scout machines, who came down on him suddenly from a great height. His machine was brought down, and both he and his observer were killed instantly. He was buried on October 1st.

Flight Sub-Lieutenant DONALD W. RAMSAY, R.N.A.S., aged 20, who was reported missing on July 7th while fighting over the enemy's lines, is now officially reported as killed on the same day. He was the second son of Mr. and Mrs. N. F. Ramsay, of Osborne Road, Newcastle, and The Grange, Alnmouth. He was educated at Corchester Preparatory School, Corbridge-on-Tyne, and at Oundle, where in 1915 he was captain of the school and also captain of the Rugby XV.

Lieutenant HUGH WELCH, R.F.C., who was missing after an air fight on March 28th last, and is now reported killed on that date, was the eldest son of Mr. T. H. Welch, Ordnance Factories' Civil Staff. He was in his 21st year and was educated at Lieutenant Chamberlain's School, Eltham, and Merchant Taylors' (1906-1912). He was with the Royal Exchange Assurance when the war broke out, and enlisted in the 2nd London Brigade R.F.A., on August 10th, 1914, being commissioned the same month. He joined the R.F.C. in September, 1915, and served as an observer at the front from October, 1915, to April, 1916, and as pilot from last December.

Second Lieutenant JOHN WORSTENHOLM, R.F.C., only son of Mr. L. Worstenholm, editor of the *Northern Echo*, Darlington, has been killed in action. Educated at Darlington Grammar School, he obtained two scholarships, and proceeded a year ago to Cambridge University. At Christmas, on attaining the age of 19 years, he joined the Artists' Rifles, and four months later was transferred to the R.F.C. He had only been at the front for five weeks.

Flight Commander J. D. NEWBERRY, R.N., killed in his 24th year was the second son of Mr. and Mrs. Charles Newberry, of the Orange Free State. He was born in South Africa, and was educated at St. Andrew's College, Grahamstown, where he gained the Goold Adams medal for science. In 1913 he entered King's College, Cambridge, and thence joined the R.N.A.S., having independently taken his pilot's certificate at the Beatty School. He became an instructor and then went abroad, where his work with the French Air Service gained him the Croix de Guerre. On February 20th last he married Mollie, second daughter of Mr. H. P. Cowper, of New South Wales. Early in March he was moved to an air station, and it was there he helped to bring down the first Hun actually over the town, for which the citizens presented him with a specially struck medal. Shortly after this he was given the rank of flight commander, and after a much-needed rest took up instruction work at Chingford. It was here that the accident occurred which caused his death on September 28th. The machine nose-dived from about 200 ft., and Flight Commander Newberry only survived a few minutes.

### Prisoner of War.

Mr. and Mrs. A. Barlow of Birkdale, have received a post card from their son, Second Lieutenant A. NORMAN BARLOW, Royal Fusiliers and R.F.C., who was reported missing in "FLIGHT" of August 30th, to say that he is a prisoner of war in Germany. Lieutenant Barlow was educated at Rugby, received his cadet training at Oxford, and was gazetted to the Royal Fusiliers, August, 1916. Last winter he was attached to the R.F.C., and went out to France as a pilot early this summer.

### Married.

Lieutenant BRUCE O. ANGELL, R.F.C., only son of H. O. Angell, of Crichel, Wimborne, Dorset, was on October 2nd married at the Roman Catholic Church, Romford, to DORIS,



only daughter of W. G. K. MATHEWS, R.I.M.S., and Mrs. Mathews, of "Parvati," Gidea Park, Essex.

On September 29th, at Binfield Church, Flight-Lieutenant CYRIL HARGREAVES FARQUHARSON BARTHOLOMEW, R.N.A.S., eldest son of Mr. and Mrs. James Bartholomew, of St. Leonards, was married to NINO, only daughter of the late Colonel F. G. B. SMERDON and Mrs. Smerdon, of Binfield, Berks.

On September 22nd, at Emmanuel Church, Clifton, GRAHAM SHURMUR BUSH, R.F.C., youngest son of Philip W. Bush and Mrs. Philip Bush, of the Old Manor House, Keynsham, was married to LEONORA BRITTAN, daughter of H. Brittan EVANS and Mrs. Brittan Evans, of 32, Pembroke Road, Clifton.

On October 4th, at the Parish Church, Cirencester, Captain R. CHARLES FOWLER, Northamptonshire Regiment, attached R.F.C., eldest son of the late Dr. O. H. Fowler, of Cirencester, to ETHEL MARY, second daughter of Mr. and Mrs. GREENE, of Moore House, Whalton, Northumberland, and Oakley Cottage, Cirencester.

The marriage took place at the Parish Church, Crossmolina, co. Mayo, on September 18th, of Captain TREVOR McDONNELL HAWKER, Royal Irish Fusiliers and R.F.C., elder son of Walter Hawker, of Anama, Clare, South Australia, and "Derrymore," Mount Lofty, Adelaide, to ELSIE KNOX, elder daughter of Ernest Henry Knox, of Greenwood Park, Crossmolina.

The marriage took place on October 2nd, at Tetbury Parish Church, of Major ERNEST LITHGOW, Royal Army Medical Corps and R.F.C., eldest son of Dr. T. G. Lithgow, of Farnborough, and grandson of the late Colonel the Hon. Ernest Curzon, and Miss DORIS BALFOUR, elder daughter of Colonel A. M. Balfour, D.S.O., Royal Field Artillery, and Mrs. Balfour, of The Close, Tetbury, Gloucestershire.

On September 26th, at the Parish Church, Great Yarmouth, by the Rev. H. H. Thorns, M.A., Rector of Rockland, Norfolk, Flight-Lieutenant LESLIE ETHELBERG RUTHVEN MURRAY, R.N., elder son of Mr. and Mrs. Ethelbert T. Ruthven Murray, of The Eyrie, Radlett, Hertfordshire, and eldest grandson of the late Sir James A. H. Murray, LL.D., D.C.L., of Oxford,

to ETHEL MILDRED DOROTHY, younger daughter of Mr. and Mrs. H. L. THORPE, of Westhay, Salisbury Road, Great Yarmouth.

The wedding took place on October 6th, at St. Mary Abbot's Church, Kensington, of Lieutenant the Hon. H. CONSTANTINE SMITH, R.F.C., second son of Lord and Lady Colwyn, to Miss MARGARET BIRKETT, daughter of Mr. and Mrs. Arthur Birkett, of Warwick Gardens, W. Captain Roy Iron, R.F.C., was best man.

The marriage of Captain DOUGLAS SPEED, K.R.R.C. and R.F.C., son of Major and Mrs. Elmer Speed, and Miss MYRTLE DERING, second daughter of Sir Henry and Lady Dering, took place at St. Paul's, Knightsbridge, on October 4th.

On October 3rd, at Castle Rising, Lieutenant ARTHUR BUSSELL THORNE, R.F.A., attached R.F.C., second son of Captain and Mrs. F. G. Thorne, of Heacham, Norfolk, was married to KATHERINE GWENTHOLEN, eldest daughter of the Rev. and Mrs. H. E. THURSBY.

#### To be Married.

A marriage will take place at St. Paul's, Knightsbridge, at 2.30 on October 13th (leave permitting) between Lieutenant JACK E. ADDINSELL, Royal Munster Fusiliers, and R.F.C., third son of Mr. and Mrs. W. Arthur Addinsell, of Harrow Weald Lodge, Middlesex, and MURIEL, second daughter of Mr. and Mrs. R. J. BLACK, of 29, Wellington Court, S.W., and The Knipp, Chiddingfold, Surrey.

The engagement is announced of Lieutenant ROGER BROUGHTON, Leicestershire Regiment, attached R.F.C., son of the late Alfred de Delves Broughton and of Mrs. Broughton, of Tunbridge Wells, Kent, and AROUYA R. LUCAS, daughter of Mr. George John Lucas, J.P., Kent, and Mrs. Lucas, of Milton Court, Milton, Kent.

#### Items.

The will of Second Lieutenant T. F. LUCAS, Warwick Regiment and R.F.C., son of Sir Edward Lucas, Bart., of North Gate, Regent's Park, who was killed in action, has been declared at £5,549.

#### Alterations in R.F.C. Pay.

AN Army Order published on October 1st substitutes the following for Articles 223 and 225:—

"223. An officer whilst undergoing instruction in flying shall receive continuous flying pay at the rate of 4s. a day in addition to the emoluments of his rank or appointment.

"225. Flying pay under Article 222 may be issued continuously to an officer who is a qualified aeroplane or balloon pilot and graded as a flying or balloon officer, flight or squadron commander, during such time as he is employed on duty which involves flying. It may also be continued up to a limit of three months during periods of special Royal Flying Corps duty not involving actual flying.

"The following shall be substituted for the first paragraph of Article 226A:—

"226A. An officer while undergoing a course of instruction in aerial observation duty shall receive continuous flying pay at the rate of 3s. a day in addition to the emoluments of his rank or appointment.

#### "Army Council's Instruction.

"Article 225. The continuance of flying pay while on special duty not involving flying does not apply to officers employed on ground duty which unfits for flying, but only to specially authorised instructional tours, &c., on Royal Flying Corps duty undertaken by officers who are at the time in receipt of flying pay."

#### Air Fighting in September.

"SEVEN hundred and four aeroplanes and seaplanes were brought or driven down on the Western front, including the Belgian coast sector—during September," says the *Times* in its excellent monthly summary. This is a higher total by nearly 300 than was reached in the preceding month and compares with 467 in July, 713 in May, and 717 in April of this year. The Allies, according to the claims of German Main Headquarters, lost 242 machines, and the German aeroplanes and seaplanes which fell to British and French airmen and gunners numbered 462.

"The month's air warfare was distinguished by several interesting features. British airmen set up a "record" in the number of German machines accounted for on one day. This was on September 25th, when 24 enemy aeroplanes were brought or driven down with the loss of only one of our machines. Our naval air squadrons were

unusually active in raiding German bases in Belgium and on the coast. Only one of their machines failed to return, and, as a set-off, they destroyed or drove down seriously damaged nearly 20 German aeroplanes and seaplanes. Several leading German airmen were killed on the British front. These included Lieutenant Voss and Lieutenant Wolff, both of whom were credited with over 40 aerial victories. Baron von Richthofen, the leader of the squadron which bears his name, and of which both Voss and Wolff were members, was reported during the month to have achieved his 61st victory. The deliberate and systematic bombing of hospitals behind the British and French lines has for ever disgraced the German air service.

"The French particularly, and the Allies generally, suffered a serious loss in the death of Captain Guynemer, who was one of the most brilliant and successful airmen on the Western front."

#### British Reports.

Enemy machines brought down	143
" " driven down out of control	142
British machines missing	112

#### French Reports.

Enemy machines brought down	91
" " driven down in their own lines	79
" balloons brought down	3

#### German Reports.

Allied machines shot down	242
German loss of machines admitted	3
Allied balloons brought down	8

#### Wounded on Trial Trip.

It now appears that Capt. Heurteaux, the famous French flyer, was wounded while putting a new machine through its paces. It appears that he was at a height of 21,900 ft. and nearing Ypres when a German attacked.

Unfortunately something went wrong with Heurteaux's machine gun, and he was unable to continue the struggle, and dived to break off the combat. In a descent of about 15,000 ft., he was hit by a bullet on the left side, but he pluckily succeeded in making a landing in a British aerodrome.

# MAGNETO IGNITION.

## III.—HOW THE VARIOUS PARTS ARE CONNECTED.

HAVING seen what are the principal parts of a high tension and the principles upon which they work, it may be as well to glance at the way in which they are arranged, in a typical magneto, in order to carry out their functions. In Fig. 13 the various parts—with the exception of the magnets, pole pieces and framework—are shown distorted, but in their relative positions, so that the way in which the current of electricity, after being generated, is passed on, until it reaches the sparking plug, can be followed clearly. In order not to make this illustration too complicated, the way in which the armature is made up is shown separately in the diagrammatic section, Fig. 14.

To follow the sequence of events attention must first be given to Fig. 14, in which the low tension or primary coil is shown by the thick line, while the high tension or secondary winding is represented by the thin lines. Starting from "earth" the low-tension coil goes to the point A, from which it is connected to B, and so through the metal of which that part is made to the screw C, which, as shown in Fig. 13, is one point of the low-tension contact breaker. When the

in the previous chapter. One side of the condenser is connected with B, while the other side is "earthed" through the casing, by way of a little spring contact, shown in Fig. 13.

The contact breaker being mounted on one of the spindles of the armature revolves with it, and twice in each revolution the striker is pushed inward by one or other of the cams. This motion is transmitted to the other end of the bell-crank lever D, causing the contacts to separate and breaking the circuit. The current is then diverted into the condenser, which, as already explained, acts as a spring buffer. Owing to the comparatively large surface which the sheets of tinfoil represent in the aggregate, the condenser can take the charge very rapidly, but its natural state of electrical equilibrium makes it endeavour to discharge it as quickly as possible. It absorbs the electricity, which would otherwise form a spark as the contacts separate, but it immediately recoils, and the current going back to A passes into the high tension, or secondary, augmenting the current already there. The opposite end of this coil is connected to the brass ring in the groove at the other end of the armature.

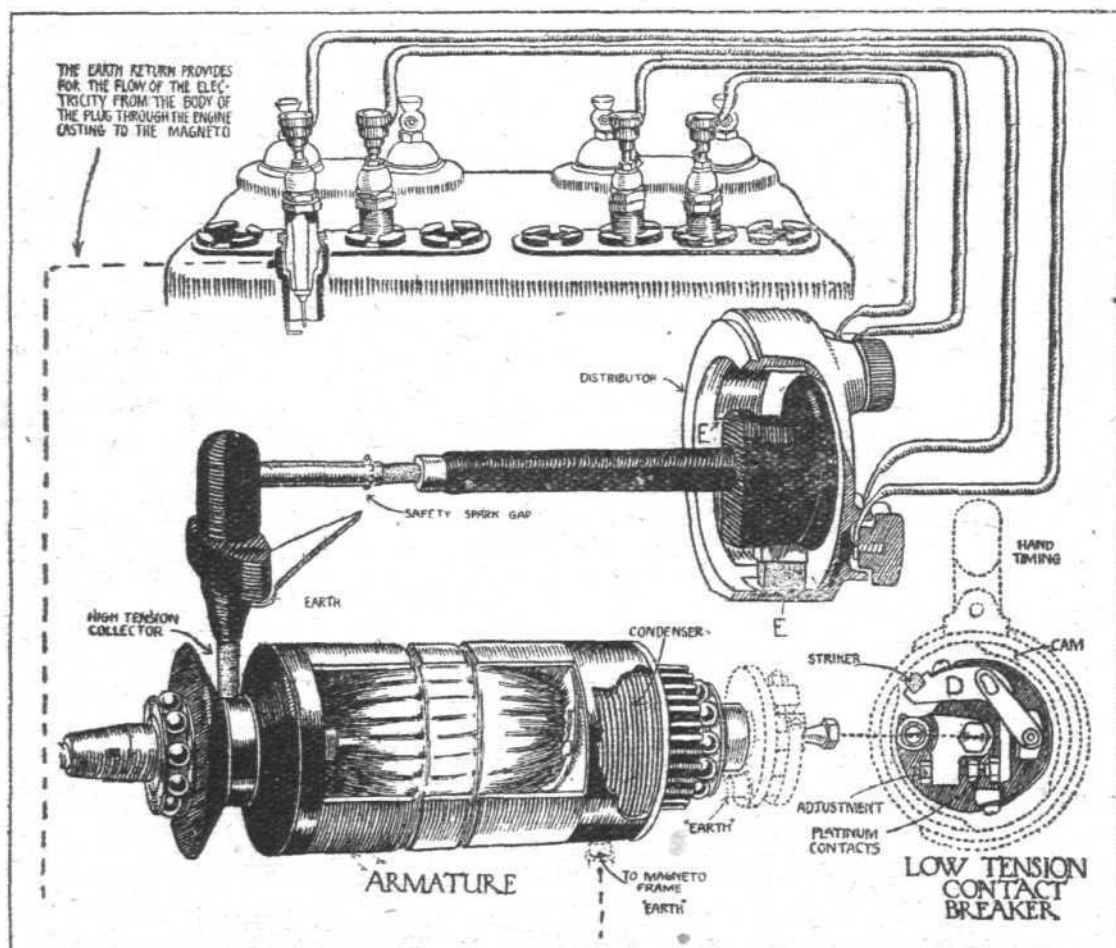


Fig. 13.—Diagram showing the various parts of the magneto and the way in which they are connected and work together.

contacts are closed the current goes on through them, and the bearing of the bell-crank lever D, to the "earth" connection on the casing of the low-tension contact breaker, thus completing the circuit.

Here it may be explained, for the benefit of those whose acquaintance with electricity is of the slightest, that although it is necessary to have a complete "circuit" before a current of electricity can be set in motion, it is not essential to provide a definite path for the current on its return journey to its starting point, so long as there is metal all the way between the two points. Thus if the first "earth" is in metallic contact with a convenient part of the frame and the second "earth" is also connected with the frame, provided the pieces of metal intervening are either in direct contact or joined by screws, it will complete the circuit satisfactorily. The term "earth" was originally used in connection with other applications of electricity, such as telegraph work, where the two ends of the wire are run into the earth, which thus acts as a return and saves the expense of a second wire. The French term "masse" is much more appropriate.

Returning to Fig. 14, it will be observed that the condenser is placed in a casing at the end of the armature. This makes a convenient arrangement; the sheets of tinfoil are of circular shape, but the principle is the same as described

From this ring the current is picked up by a carbon brush—a little stick of carbon with a spring behind it to keep it in contact with the ring—and is led to the high-tension distributor. This is a circular box, in the side of which are slips of brass, E, according to the number of cylinders. Revolving inside the box, driven by a gear wheel from the gear wheel on the armature, is a fitting from which projects a carbon brush which rubs over the contacts as it goes round. The current passing through the carbon brush enters the brass slip, with which it is in contact, and so by way of the wire to the sparking plug, where the spark occurs. The outside of the sparking plug being in contact with the engine, forms an "earth" connection by which the circuit is completed back to the earth on the magneto frame.

It will be noticed that to the right of Fig. 14 is fitted a switch, which is for the purpose of "cutting out" the magneto, thus rendering it inoperative. The way in which it accomplishes this is by providing a bye-pass for the low-tension current, so preventing it entering the high-tension circuit. At the low-tension live end, there is a spring contact which takes the current to a terminal, on the casing of the contact breaker, and that terminal is connected by wire with one side—that marked "off"—of the switch on the dashboard, or other convenient position. The circuit is completed through



the bar of the switch and its pivot, which is connected with an "earth" return to the magneto frame. The reason why what would in ordinary electrical parlance be called the "on" position is termed "off," is because by short-circuiting the low-tension circuit, it practically cuts "off" the high-tension current, while when the switch is moved to the "on" position, the current is forced to follow the course already described in detail.

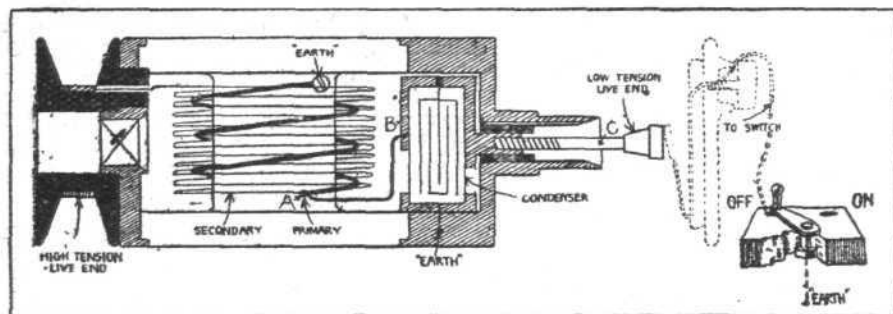


Fig. 14.—Diagrammatic section of the armature and the switch connection.

position, the current is forced to follow the course already described in detail.

It has been stated in an earlier chapter that the current of electricity reaches its maximum pressure when the armature is in the vertical position. While that is so theoretically, in practice the maximum pressure occurs when the armature has rotated a little past the vertical position. This is due to the tendency of the armature to drag the magnetism round with it, as if it were some sticky substance which clung to the armature core and found some difficulty in detaching itself. Moreover, this magnetic drag varies with the speed so that it is necessary to adjust the contact breaker to suit the varying conditions if the maximum amount of electricity is to be secured and utilised to the best advantage.

It is also desirable to be able to adjust the moment at which the spark occurs because under certain circumstances it may be required to fire the charge in the cylinder either earlier or later than for normal running. The casing of the contact breaker is therefore not fixed; in the sketch of this fitting in Fig. 13 it will be noticed that to the top is attached a little lever, and this permits of it being moved round a certain distance. As the cams which operate the bell crank lever D are mounted on this casing their relative position will be altered according to the direction in which the casing is moved, and the contacts will be separated sooner or later as the case may be.

The direction in which the maximum position tends to shift with increasing speed is opposite to the direction in which the timing lever is moved to advance the ignition. Consequently, if the magneto is set so as to make the maximum position at high speeds coincide with the operation of the contact breaker, there will be great difficulty about obtaining any spark at all when the lever is retarded for slow speed and starting. Alternatively, if the magneto is set so as to give the best spark at very slow speeds, the sparking at high speeds may tend to be sluggish. The high speed in itself, however, increases the voltage over the

whole range, and so tends to mitigate this drawback. It is, in fact, on the rise in voltage with increasing speed that the fixed ignition systems depend for their automatic advance, which is in itself merely a tendency to reduce the lag in the system at all points, owing to the superior effect of a higher pressure.

With the ordinary type of pole pieces having parallel sides there is a tendency for the magnetism to crowd into the centre and hang on to the very last moment, when the reversal takes place with very great suddenness. This, however, gives practically no range for the adjustment of the timing. Experimenting some years ago, Mr. Blackwood Murray found that by making the trailing edge of the pole pieces at an angle—see A in Fig. 15—instead of parallel to the axis of the armature, the point of maximum current occurred earlier, instead of later, as the speed of the armature increased. Apparently as the speed increased the magnetic lines did not have time to crowd together, but were cut as soon as

the edge of the armature began to pass the edge of the pole piece, and the magnetism was distributed in such a way as to give a range of maximum positions.

In an endeavour to attain a similar end, the pre-war Bosch magnetos were fitted with pole pieces having a

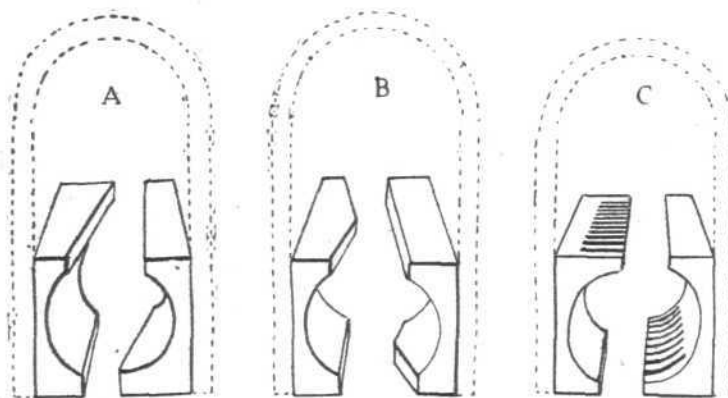


Fig. 15.—Three different types of pole shoes devised to give a greater range of timing.

series of projecting teeth, as shown at C, Fig. 15. In later designs a thin lip was formed on the edge of the pole piece instead of the comb edge, while since the war an arrangement of sliding pole pieces has been developed.

Another variety of pole piece, designed to take advantage of the tendency of the magnetic lines to crowd into the centre, is that shown at B, Fig. 15. This is fitted on the Eisemann machines, and it is claimed that the concentration of the magnetic lines causes them to be cut with a snap producing greater electric pressure and in consequence a more efficient spark.

(To be continued.)

#### A New American Engine.

PRODUCED by Mr. Hall, of the Hall-Scott Aeroplane Co., of San Francisco, and Mr. J. G. Vincent, well known for his work with the Packard Motor Co., a new aviator motor which has been recently tested in Washington, promises well. Apart from the two well-known designers mentioned above, others who have co-operated in its production are Mr. Glenn H. Curtiss and Mr. C. M. Manley, of the Curtiss Co. Details are lacking at the moment, beyond the statements that three men can lift the motor, that it can enable an American battleplane to fly 140 miles per hour. It is said to have made test runs of 10 and 50 hours' duration.

#### A German Machine Over Switzerland.

It was reported from Geneva on October 5th that a German aeroplane passed over Basle at an altitude of 2,400 to 3,000 ft. It was fired at by the Swiss guns, but without result.

#### German Aeroplane Makers Strike.

By way of the Hague comes reports of serious labour troubles at aeroplane factories in the Berlin districts. Work was said to have been stopped for 10 days, some 40,000 workmen being involved, the cause of the strike being bad food and insufficient wages. On increased pay being granted

and increased bread rations arranged for, work was resumed on October 3rd.

#### Russians Capture Hun Air Chief.

A communiqué from the Caucasus Army on October 6th states that a daring raid by Russian scouts recently resulted in the capture of Count von Meyer, chief of the German Air Service in the Black Sea.

#### "The R.F.C. Records."

WHEN the time comes for a history of the Royal Flying Corps to be written, those who essay the task will be grateful to Capt. G. L. Campbell, R.F.A., who has compiled a useful book which gives classified lists of honours and decorations conferred, lists of casualties, and a very large number of biographies of officers who have been killed. The information in the book is that available up to July last and Capt. Campbell would be glad if relations of officers whose biography is not given would communicate with him so that the next edition may be made as complete as possible. The book is published by the Picture Advertising Co., Ltd., of Cromwell House, Holborn, W.C., and costs 3s. in cloth and 1s. 6d. in paper covers.

## SIDE-WINDS.

SOME details of the company formed by Mr. Henry M. Leland, and his son Mr. Wilfred C. Leland, who recently resigned from the Cadillac Co., as mentioned in this column a few weeks ago, are now to hand. Their new company—capitalised at \$1,500,000—is to be known as the Lincoln Motor Co., and operations have already been commenced at a factory in Detroit. It is hoped that 2,000 men will shortly be at work, and an output of 20 U.S.A. aeroplane engines per day is being arranged for.

WHEN anything is wanted in a hurry the great thing is to know where to look for it. Messrs. Whiteman and Moss, of 15, Bateman Street, W. 1, report having a good stock of wire ferrules and B.H. thimbles at the present time. They are priced at a reasonable rate, and we understand that immediate delivery can be given in fairly large quantities.

AN interesting trade development is the arrangement concluded by Messrs. S. Smith and Sons (Motor Accessories), Ltd., 179-185, Great Portland Street, W. 1, for taking over the well-known aviation instrument business, including the patent rights, of Mr. E. Hollocombe Clift, Bronnley's Corner, Acton Vale. This will enable Messrs. Smith and Sons to offer a more complete range of aviation instruments, and as Mr. Clift will remain with them as consulting engineer on aviation matters, more developments may be looked for.

MESSRS. BROWN BROS., of Great Eastern Street, E.C. 2, have recently made arrangements whereby deliveries of A.G.S. 136 thimbles, in all patterns, can be delivered from immediate stock. All thimbles are passed A.I.D. before despatch, and the prices are distinctly competitive.

PALLADIUM AUTOCARS, LTD., of Felsham Road, Putney, S.W.15, are now devoting a considerable portion of their extensive works to the manufacture of aeroplane metal parts, as distinct from the aeroplane engine parts, on which their machine shop has been fully engaged for a considerable time past. Their organisation enables them to cope with any class of metal or machine work, and all kinds of welding, pressings, stampings, &c.

IN writing recently of the sparking plugs produced by the Forward Motor Co., one of those little slips, which appear

inevitable while human nature is what it is, crept in, but fortunately it was so obvious that no one could be misled by it. At the same time it may be as well to point out that the Forward Co. are not fitting the copper fins because of the non-conductivity of copper. What was meant, of course, was that the excellent radiating quality of thin copper was being taken advantage of, in order to conduct the heat away from the plug. This sparking plug—Model S—is proving very satisfactory in use on stationary engines—the fins on the barrel having good effect. For use on rotary engines the firm also produce the Model R—a plug made on similar lines, but without the fins. The Forward Motor Co., Birmingham, will be only too pleased to place their extensive experience at the disposal of any firm having trouble through sparking plugs heating up.

To get something off the price of any commodity in these days, when the prevailing idea appears to be the everlasting putting of something on, is somewhat of a shock. Yet this is the case at Robinson and Cleaver's, The Linen Hall, Regent Street, who are concluding their brief sale on October 13th. Irish linens at 5s. 6d. to 6s. 8d. in the £ off current prices is the great attraction, and it is not yet too late to participate. Even those who are striving with might and main to provide the country with all the aeroplanes required, must go home to rest and sleep sometimes, and there is nothing more refreshing than for the tired and jaded worker to creep in between fresh Irish linen sheets. In these strenuous times one is apt to think more of the provisions of the factory than the wants of the home, to the detriment of the latter. Here is a chance for the wives or daughters or sisters to be completely in their element, and at the same time provide for the comfort of the head of affairs. Real Irish linens are none too plentiful just at the moment, but Messrs. Robinson and Cleaver have their own factories in Ireland, and so are in a position to supply the real article at a discount, even at a time when things in general are notoriously dear.

Their Aviation Clothing Department is also at this moment stocked with articles embracing many new ideas, and will well repay a visit by the mere male whilst the female side of the household is negotiating for bargains in the "all white" department.

### More Women for the R.F.C.

ALTHOUGH the response made to the appeal for women for the Women's Army Auxiliary Corps has so far been very encouraging, a total of 10,900 applications having been received, there are still vacancies.

In addition to the 10,000 women which the War Office notified to the Employment Department would be required by the end of October, large numbers are wanted for work under the Royal Flying Corps. These women will be required to work in the aircraft repairing depôts, both at home and in France. The numbers wanted immediately by the Royal Flying Corps are as follows:—

144 fitters (general machine and turners), 52 instrument repairers, 20 acetylene welders, 37 electricians, 12 draughts-women, 55 painters, 2 tracers, 145 storekeepers (Class I) (these women are required for technical stores and should have a knowledge of engine parts and tools), and 503 sail-makers for work of making and repairing aeroplane wings (for this purpose good needlewomen who can also use sewing machines are wanted).

In addition, tinsmiths, coppersmiths, and tender drivers are wanted. All applications should be made to the Exchanges, where full information will be supplied.

### Navy League and Aircraft Policy.

AT a meeting of the Executive Committee of the Navy League, held on October 4th, the question of the pressing necessity of a more thorough and comprehensive aircraft policy was further considered.

The resolutions pressing this on the notice of the Government which were adopted at the meeting of the Executive Committee of the League on September 20th have been circulated to the Chambers of Commerce and other representative bodies of the country, and have received general approval.

The Committee heartily supported the demand that the raiding of German towns should be persistently carried out, but at the same time felt very strongly that in any contemplated plan of aircraft offensive upon enemy territory there should not be and there must not be any interference with the full aircraft requirements of the Navy and Army. In the view of the League it is of much more vital moment to maintain the highest measure of aircraft efficiency at sea and on the

Western and other fronts than to employ for long-distance raids machines which otherwise would reinforce aircraft squadrons used in direct co-operation with our fighting forces.

No injury inflicted upon German towns can compensate for diminished supplies of men and machines where they are most needful and where alone Germany can be crushed, and that is with our commanders at sea and in the field.

The destruction of the aerodromes from which the enemy's raiding squadrons start is the best way to protect London and the exposed districts of England.

### Bombing Enemy Bases.

MUCH havoc was wrought on the Flemish coast by Allied aviators during the fine weather of the first few days of the month, says the *Telegraaf*. The Germans keep a very careful watch for their coming from observation balloons and high positions, and whenever an alarm was given civilians went to their shelters and the soldiers, many of whom were "resting" at the coast resorts, went to their holes in the dunes, while German aeroplanes went up. Heyst, Knocke, Westcappelle, Ramscappelle, and Lisseweghe shook to their foundations by the guns and bombs. Heavy bombs fell on the Yser road bridge of Zeebrugge, and ten Marines were killed and many wounded. Others fell on Heyst and near Het Sas. Three villas collapsed, and wounded soldiers were afterwards removed from the *d'bris*.

On the evening of October 2nd bombs fell near Zeebrugge Lock, the innermost gates of which warped. Great openings were also made in the quay walls, and six torpedo-boats lying between the locks and the Solvay factory were shut up in the canal. Soldiers were obliged to work day and night on the lock and quay, and it was not until two days later that the vessels were liberated.

### A Speedy Machine from Spain.

FROM Madrid comes a report that a biplane has been constructed at Santander in accordance with the design of a Spanish engineer, which introduces many improvements tending to give greater stability to the machine.

The trials with the new machine will be made by the Aviator Rombo, who proposes to fly at a great height and at a speed of 105½ m.p.h. The trial trip is to be in the nature of a non-stop from Santander to Madrid.



## FATAL ACCIDENTS.

At an inquest on 2nd Lieut. F. C. Nesor, R.F.C., who was killed in the Lincoln district on October 1st, it was stated that he had been on three weeks' sick leave following a smash. He came back, and after a flight on a dual control machine went for a solo trip. The machine was seen to make a flat turn to the right at a height of 75 ft. and dived to the ground. The petrol tank burst and went on fire, the pilot being so severely burned that he died in hospital. A verdict of "Death from Misadventure" was returned.

"Accidental Death" was the verdict at a Westminster inquest on October 4th on 2nd Lieut. W. Featherstone, R.F.C. During a practice flight in Middlesex on October 3rd he "taxied," and then rose too steeply to a height of about 100 ft., the machine then crashing down in a vertical nose-dive. Brother officers expressed the opinion that he lost his head on realising his difficult position.



## Well-Known French Athlete Injured.

News was received in Paris from Lyons on October 3rd that Adjutant-Pilot Delaplane, champion sculler of France and ex-champion of Europe, had met with a serious accident at the Bron Aerodrome. A new machine which he was testing fell to the ground, and he sustained a broken leg and fracture of the skull.

## Lieutenant Voss's Last Fight.

"The circumstances of the death of the famous German airman Voss have been established," writes the *Times* correspondent at the British Headquarters on October 1st. "His body has been found and identified, and our flying men are dropping messages on his home aerodrome telling the Germans of the fact.

"One of our patrols was sent out and fell in with a German two-seater. The leader of our patrol attacked it and sent it down with smoke pouring from it. The patrol was resumed, and soon some enemy biplanes, accompanied by one triplane, were seen, and the enemy engaged. The triplane and one other machine fought well, but the other enemies, including a squadron of 11 machines hovering near, took no part, but were kept at a distance from the scene of battle. The fight practically resolved itself into a duel between the triplane and one of our machines flown by an airman who has already gained honours by his successes.

"The two aeroplanes circled round each other in such close combat that often they missed colliding with each other's wings apparently by inches. In the course of this manoeuvring our man had fired three drums into the enemy, but apparently he was unhurt. At last our flyer succeeded in getting above the other and emptied another drum into him. The German began descending, and our man followed, firing two more bursts into him as he went. The enemy, without replying, went gliding on, then swung suddenly to the right as if out of control, and plunged down to where he was lost sight of in the smoke and mist.

"Yesterday the remains of the shattered triplane with the body of the pilot, identified as that of Voss, were found. There seems no doubt that he was shot dead in the fighting. Onlookers in other machines say that in handling his aeroplane during the fight the British airman was magnificent."

## The Capronis at Work.

Writing to the *Daily Mail* from the Italian Army Headquarters on October 7th, Mr. J. M. N. Jeffries says:—

"During last week on this front aviation has quite dispossessed the land operations, which have been limited to skirmishes. In the air, big Caproni squadrons (very large biplanes with two pilots, a bomber, and an observer) have daily patrolled above Austrian territory and have dropped cargoes of explosives on the enemy's lines of communication, especially upon the railway in the Val di Bazzà, by which Tolmino is furnished with supplies.

"The Austrians seem to be making a rather late effort to react against Italian air superiority, and what is apparently a new type of machine has appeared—a rather short, squat chasing biplane, which is thought to be of German origin. These do not offer battle on equal terms, but if they see one of the slower bombing machines at all isolated they hasten to attack it.

"Air barrages have been highly developed by the enemy, and a single scouting machine flying near Trieste—this was before the advent of the new Austrian chasers—received the

A fatal accident occurred in the Solent on October 3rd to Flight-Lieut. J. Douglas, R.N.A.S. The seaplane in which he was making a flight was seen to side slip and fall into the sea. It turned over, and the officer was held by it below the surface. Medical assistance was prompt, but on being extricated he was found to be dead, although artificial respiration was tried for some time. At the inquest a verdict of "Accidental Death" was returned.

A double flying fatality in Warwickshire was investigated by a coroner's jury on October 8th. The evidence showed that the accident was due to an error of judgment on the part of the pilot, 2nd Lieut. Lewis, who attempted a left-hand turn at a height of 100 ft., apparently thinking he was higher. In the fall, 2nd Lieut. Thornton, who was acting as observer, had his neck broken. A verdict of "Accidental Death" was returned. 2nd Lieut. Lewis, who had several limbs broken, has also died.

continuous attentions of several batteries for three-quarters of an hour.

"The culmination of the Italian week has been the raid over Cattaro (the naval base adjoining Montenegro). A number of Capronis took part in this raid, each before dropping its bombs having to cross nearly 150 miles of open sea, which they did in about 2½ hours, and arrived in a long line 13,000 ft. high over Cattaro between 12.30 and 1 a.m. on a clear night. The Austrians opened a heavy but not co-ordinated fire from Mount Lovchen and other points, but the Capronis were able to discharge their 'Giacomini' ('Little Jims,' the Italians' pet name for bombs) with marked accuracy, descending low for the purpose. Some anchored submarines were hit and presumably destroyed, and clouds of smoke poured from a building of the arsenal where other submarines were being repaired. 'The whole bay seemed to be ringed with fires,' said one of the airmen, 'just before we left at 1 o'clock.' D'Annunzio, the poet, was second in command of the expedition."

## America's Aviation Effort.

A STATEMENT which is said to have been given out at Washington by Mr. Baker, the United States War Secretary, sets out that the 20,000 aeroplanes authorised in the vote of £128,000,000 provided by Congress are now under construction. They comprise all types, from scouts to powerful bombing and battle planes. The response to the call for aviators is said to have been good, and it is expected that pilots and gunners will be ready for service as soon as the machines are constructed. Twenty-four flying schools have been authorised and thousands of pilots are being trained.

In order to assist the United States in the production of aircraft, thirty expert officers—ten from each—have been lent by the Flying Services of Great Britain, France and Italy.

## Reprisals and Rehearsals.

EVIDENTLY the announcement that the British Government intends to undertake reprisals has provoked uneasiness in South Germany. The Burgomasters of Karlsruhe, Baden, Constance and Friedrichshafen were hurriedly summoned to a conference to discuss defensive measures.

Another report says that last week one or two Zeppelins were supposed to have cruised over several Rhenish towns, in order that the authorities in the various places might have an opportunity of rehearsing their air-raid precautions. As soon as a Zeppelin was reported, lights were put out, and the people rushed off to shelters.

## German Aviator Attacks Hun Prisoners.

THE *Times* special correspondent writing on the latest victory in France says:—

"After capture, as you know, prisoners going back are often employed to escort or carry back their own wounded. I am sorry to say that there is no doubt that on one part of the line some of these men were killed by a German aeroplane, which flew down and used a machine-gun on them. There can be no question that the airman knew precisely whom he was killing and the occupation on which they were engaged. And this airman was one of very few Germans who came over the battlefield at all that stormy day. I have already told how magnificently some of our flying men did, and I have since heard from more than one quarter how our infantry watched our men overhead, battling with wind and rainstorms, making observations and keeping the air clear, while not a German was to be seen.

## LEGAL INTELLIGENCE.

### The Admiralty Aeroplane Contracts Case.

At the opening of the October Sessions on October 9th, on the application of Mr. H. D. Roome, appearing for the prosecution, the hearing of the case of Mr. W. A. Casson, on bail, who is charged with conspiring to contravene the provisions of the Prevention of Corruption Act in respect to Admiralty contracts relating to aeroplanes, was postponed until the next Sessions owing to the serious condition of Wing Commander Porte.

### A Question of Patents.

In the Vacation Court, on October 3rd, Mr. Justice Hill was asked to restrain D. & D. Girdwood, Ltd., at their meeting on October 8th, from acting upon their notice calling that meeting, in which they proposed to take an assignment of certain aeroplane and aircraft patents from Mr. David Anderson, who is one of the directors of the company.

Counsel for the plaintiff, Mr. Taylor, said his client, the inventor, was introduced to Mr. Anderson and, after certain negotiations, by the latter to his patent agents and solicitor. He alleged that he signed certain documents and advanced considerable sums of money, the defendant, Mr. Anderson, undertaking to form a company to exploit the patents. D. & D. Girdwood, Ltd., had been formed for this purpose, and a meeting had been called for October 8th, at which an assignment was to be made; but the plaintiff alleged that his interests had not been properly safeguarded. He said he had not consulted a solicitor before signing the documents, which he had not properly read.

His Lordship adjourned the motion to the second motion day of next Sitting, and in the meantime granted the injunction, with the usual undertaking in damages.

## LOOKING AHEAD.

It is not our habit to draw attention in our editorial columns to announcements appearing in our advertisement pages, and when we make an exception this week with regard to Messrs. Wakefield and Co.'s "Castrol" advertisement, it is solely because the illustration therein is meant to be—as a number of the firm's illustrations have been of late—somewhat by way of a prophecy. We are inclined to think, however, that for one thing the date is a little previous—1918 will scarcely see a "bus of the dimensions laid down for the "Dreadnought Hydro-Aeroplane." At the same time there can be no manner of doubt that the machine of large dimensions will be forthcoming, and in spite of sundry technical shortcomings—to which reference will be made presently—the scheme outlined in the illustration will no doubt fire the imagination of the man in the street, on whom, after all is said and done, depends to a very large extent the future of aviation. To him there will possibly not be anything particularly difficult in producing an aeroplane of some 500 ft. span, and with a horse-power of 28,000 to 30,000, and if the great B.P. will only shout loud enough and long enough for machines of such sizes—well, it will be only a matter of time for the technician to evolve it.

To the casual observer it might appear that all that is necessary is to multiply present machines by, for instance, five in every respect, and the super-aeroplane is an accomplished fact. From the personal notes of the designer of the "Dreadnought Hydro-Aeroplane" it appears that he anticipates a speed of 500 m.p.h.—(he points out, however, that this is the maximum)—so that apparently he has multiplied by five in every respect. On making rough calculations we arrive at the result that the estimated speed would probably be nearer when it has an o knocked off, taking the designer's own items of weight and power. One little item that has apparently been overlooked is the difficulty of designing a single propeller—even if it does have four blades in the best approved R.A.F. style—which will transmit a bagatelle of 3,700 h.p. According to the admittedly limited knowledge of the present day, the limit is attained long before reaching such powers. With regard to the engines themselves, no information is tabled as to type, &c., but some of them are to be round about 5,000 h.p. each. It is safe to assume that they will not be 9-cylinder rotaries. One thing we are assured, however—that they will use "Castrol" oil, of which it is to be hoped there will be a very plentiful supply, or a few of these monsters in being would speedily spell an oil famine.

One feature of the design, which in these days of tanks and caterpillars should appeal to the non-technical mind, is the under-carriage, which is in the form of floats, fitted with caterpillars running on ball bearings, so as to make the machine amphibious. It has been suggested by evil-minded and unimaginative critics that the object of this combination is to be sought for in the small extent of these islands of ours.

In other words, should the machine, after making the straight run from London to the Bristol Channel by way of a "take off," fail to rise, she can proceed as a seaplane across the Atlantic until she does manage to get "unstuck." Apart from such minor technical shortcomings, however, the illustration is useful in getting the mind started along really big lines, and who knows, but that one of these days an aerial Dreadnought somewhat resembling the suggested "Castrol" consumer will be laying its eggs on Berlin. Wait and see.

## COMPANY MATTERS.

THE directors of the Fellows Magneto Co., Ltd., which was formed in August, 1916, to acquire as from July 1st, 1916, the business of Fellows and Co., have issued a statement as to the company's position. The value of the output in May was £4,384; in June, £5,350; and in July, £7,263. It is hoped that by the end of December the monthly output will exceed £14,000 in value. Additional capital expenditure since the company started trading amounts to £27,060. On August 31st the company's liquid funds amounted to £18,569. Treasury consent has been granted for a further issue of £40,000 in preferred shares, but a decision has not yet been come to as to when this issue will be made. The directors hope to be able to recommend an ordinary dividend with the final dividend on the preferred shares for the current year.

### NEW COMPANIES REGISTERED.

**NATIONAL AIRCRAFT MANUFACTURING CO., LTD.**, 15, Drummond Crescent, St. Pancras, N.W.—Capital £5,000, in 3,000 preference shares of £1 each and 8,000 ordinary shares of 5s. each. Acquiring business of manufacturers of aeroplanes and parts carried on by F. Norman and Mrs. G. Norman, at 15A, Hackney Road, as the "National Aircraft Manufacturing Co." First directors: F. Norman and W. Fowell.

**ROOTES, LTD.**, Len Engineering Works, Mill Street, Maidstone.—Capital £10,000, in £1 shares. Aviation, automobile and general engine construction and repairing experts, &c. First directors: R. Rootes, W. E. Rootes and R. C. Rootes.

**WYCOMBE AIRCRAFT CONSTRUCTORS, LTD.**—Capital £50,000, in £1 shares. First directors: G. H. Thomas, H. Burroughes, and G. A. Peck.

### BUSINESS NAMES REGISTRATIONS.

**AVIATION SUPPLY CO.**, 195, Upper Thames Street, E.C.4.—Registered, September 28th, 1917. Proprietor, George E. Bearns (Canadian), 24, Queensdale Road, Norland Square, W. Other business occupation: general merchant. Business commenced: September 27th, 1917.

### Germany Exporting to Holland.

According to the *Handeleblad* twelve large aeroplanes for the Dutch army arrived last week at Bentheim (Hanover), where they will be taken over by Dutch flying officers.

### Aeronautical Patents Published.

Applied for in 1916.

The numbers in brackets are those under which the specifications are printed and abridged, &c.

Published October 11th, 1917.

13,378. C. M. WATERLOW. Airships. (109,492.)

13,542. A. E. LONGMORE and F. TRUSSLER. Apparatus for saving life on aircraft. (109,496.)

13,918. N. H. W. MACLAREN. Aerial propellers. (109,503.)

If you require anything pertaining to aviation, study "FLIGHT'S" Buyers' Guide and Trade Directory, which appears in our advertisement pages each week (see pages xlii, xliii and xliiv).

## FLIGHT

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